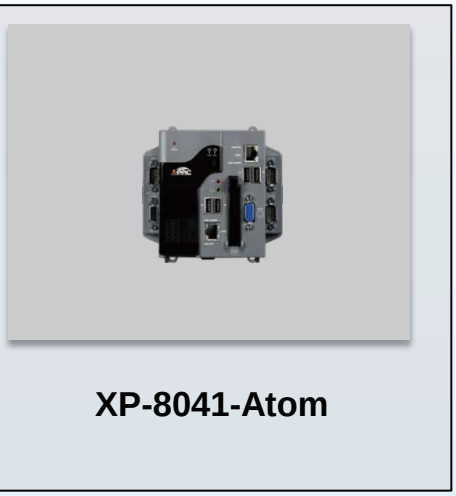
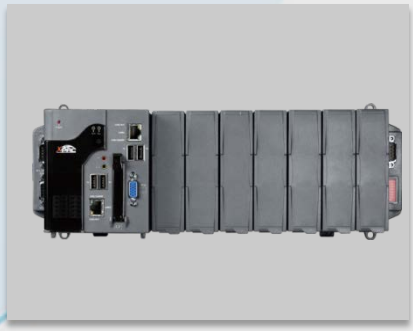
# XP-8000-Atom Series
# User Manual
## (Windows Embedded Standard Family)



XP-8041-Atom

XP-8141-Atom

XP-8341-Atom



XP-8741-Atom

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Industrial Communication Products



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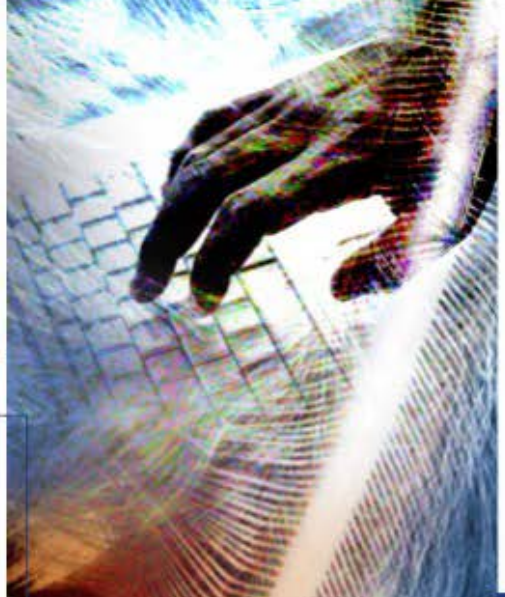

# 1. Introduction

This chapter provides an overview of the XP-8000-Atom and its components that introduces the fundamental concepts for user familiar with the XP-8000-Atom.


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XP-8000-Atom Series is the new generation Windows Embedded Standard 2009 based PACs of ICP DAS. It is equipped with an Intel Atom Z500 Series CPU, various connectivity (VGA, USB, Ethernet, RS-232/485) and 0/1/3/7 I/O slots for high performance parallel I/O modules (high profile I-8K Series) and serial I/O modules (high profile I-87K series). The benefits of running Windows Embedded Standard 2009 include

- **Enhanced Write Filter (EWF):**

  Protect disk against improper disk write operations.

- **Same Win32 API:**

  Make developing applications just like Windows XP Professional developers do.

This makes almost every PC-based program can be easily ported to XP-8000-Atom and effectively reduces the efforts of developing and shortens the time to market.

For software copy protection, programmers can design software based on the 64-bit hardware serial number for making software copy protected.


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# 1.1. Features

The XP-8000-Atom offers the most comprehensive configuration to meet specific application requirements. The following list shows the hardware and software features designed to simplify installation, configuration and application.

## Hardware Features

1. **Powerful CPU Module**
   **Intel Atom Z520 CPU (1.33 GHz)**
2. **Memory size:**
   **DDR2 SDRAM (1 GB), Built-in Flash Disk (8 GB)**
   **EEPROM (16 KB), CF Card (8 GB)**
   **Dual Battery Backup SRAM (512 KB)**
3. **VGA Port x 1, USB 2.0 Port x 4**
4. **Programmable LED indicator x 2**
5. **Audio with Microphone-In and Earphone-Out**
6. **64-bit Hardware Serial Number**
7. **Dual Watchdog Timers**
8. **4/5 Serial Ports (RS-232/RS-485)**
9. **Dual Giga bit Ethemet Ports (10/100/1000 M)**
10. **Redundant Power Input**
11. **DIN-Rail or Wall Mounting**
12. **Operating Temperature: -25 ~ +75 °C**


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# Software Features

1. **Windows Embedded Standard 2009**
2. **Internet Information Services**

   **FTP server and web server**
3. **ASP.NET**
4. **SQL Server 2005 Express Edition**
5. **.NET Framework 3.5**
6. **Remote Desktop Connection**
7. **Built-in OPC Server**
8. **Rich Software Solutions**

   **SDK for Microsoft Visual Studio.NET 2005/2008 and Visual Studio 6.0**
   **Borland C++ Builder and Delphi**


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# 1.2. Specifications

The table below summarizes the specifications of the XP-8000-Atom, and lists the accessories that XP-8000-Atom supports.

## Specification

| Model | XP-8041-Atom | XP-8141-Atom | XP-8341-Atom | XP-8741-Atom |
|---|---|---|---|---|
| **Software System** | | | | |
| Operating System | Microsoft Windows Embedded 2009 | | | |
| .Net Compact Framework | 3.5 | | | |
| Embedded Service | FTP server, Internet Information Service 5.1, ASP (JAVA script, VB script), SQL Server 2005 Express | | | |
| SDK Provided | Dll for VC, VB, Delphi, BCB, Visual Studio.NET 2005/2008 | | | |
| Multilanguage Support | English, German, French, Spanish, Russian, Italian, Czech, Japanese, Korea, Simplified Chinese, Traditional Chinese | | | |
| **CPU Module** | | | | |
| CPU | Intel Atom Z520 CPU (1.33 GHz) | | | |
| System Memory | 1GB DDR2 SDRAM | | | |
| Dual Battery Backup SRAM | 512 KB (for 5 years data retain while power off) | | | |
| Flash | 8 GB as IDE Master | | | |
| EEPROM | 16 KB, Data Retention: 40 years, 1,000,000 erase/write cycles | | | |
| CF Card | 8 GB (support up 32 GB) | | | |
| RTC (Real Time Clock) | Provide seconds, minutes, hours, day of week/month, month and year | | | |
| Programmable LED Indicator | 2 | | | |
| 64-bit Hardware Serial Number | Yes, for software copy protection | | | |
| Dual Watchdog Timers | Yes | | | |
| Rotary Switch | Yes (0 ~ 9) | | | |
| DIP Switch | - | Yes (8 bits) | | |
| Audio | Microphone-In and Earphone-Out | | | |
| **VGA & Communication Ports** | | | | |
| VGA | Yes (resolution: 1600 x 1200, 1024 x 768, 800 x 600, 640 x 480) | | | |
| Ethernet (Giga bit) | RJ-45 x 2, 10/100/1000 Base-T (Auto-negotiating, Auto MDI/MDI-X, LED indicators) | | | |
| USB 2.0 | 4 | | | |
| COM 1 | RS-232 (RXD, TXD and GND); non-isolated | Internal communication with the high profile I-87K series modules in slots | | |
| COM 2 | RS-232 (RXD, TXD and GND); non-isolated | | | |
| COM 3 RS-485 | D2+, D2-; self-tuner ASIC inside | | | |
| COM 3 Isolation | 3000 $V_{DC}$ | | | |
| COM 4 | RS-232/RS-485 (RxD, TxD, CTS, RTS and GND for RS-232, Data+ and Data – for | | | |


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| | | | | |
|---|---|---|---|---|
| | RS-485); non-isolated | | | |
| COM 5 | RS-232 (RxD, TxD, CTS, RTS, DSR, DTR, CD, RI and GND); non-isolated | | | |
| **I/O Expansion Slots (for high profile I-8K and I-87K modules only)** | | | | |
| Slot Number | 0 slot | 1 slot | 3 slots | 7 slots |
| Hot Swap * will be available | | For high profile I-87K modules only | | |
| **Mechanical** | | | | |
| Dimensions (W x L x H) | 137 x 132 x 125 mm | 169 x 132 x 125 mm | 231 x 132 x 125 mm | 355 x 132 x 125 mm |
| Installation | DIN-Rail or wall mounting | | | |
| **Environmental** | | | | |
| Operating Temperature | -25 ~ +75 °C | | | |
| Storage Temperature | -30 ~ +80 °C | | | |
| Ambient Relative Humidity | 10 ~ 90 % RH, non-condensing | | | |
| **Power** | | | | |
| Input Range | +10 ~ +30 $V_{DC}$ | | | |
| Isolation | 1 kV | | | |
| Redundant Power Inputs | Yes, with one power relay (1A @ 24 $V_{DC}$) for alarm | | | |
| Capacity | 3.6 A, 5 V supply to CPU and backplane, 25 W in total | 3.7 A, 5 V supply to CPU and backplane, 1.3 A, 5 V supply to I/O expansion slot, 25 W in total | 3.8 A, 5 V supply to CPU and backplane, 3.2 A, 5 V supply to I/O expansion slots, 35 W in total | 4.0 A, 5 V supply to CPU and backplane, 3.0 A, 5 V supply to I/O expansion slots, 35 W in total |
| Consumption | 16.3 W (0.68 A @ 24 $V_{DC}$) | 16.6 W (0.69 A @ 24 $V_{DC}$) | 16.8 W (0.7 A @ 24 $V_{DC}$) | 18 W (0.75 A @ 24 $V_{DC}$) |

# Accessories

| Model | |
|---|---|
| DRS-125 | 125 mm length , Stainless 35 mm DIN-Rail |
| DRS-240 | 240 mm length , Stainless 35 mm DIN-Rail |
| DRS-360 | 360 mm length , Stainless 35 mm DIN-Rail |
| DP-660 | 24 $V_{DC}$/2.5 A, 60 W and 5 VDC/0.5 A, 2.5 W Power Supply with DIN-Rail Mounting |
| DP-1200 | 24 $V_{DC}$/5.0 A, 120 W Power Supply with DIN-Rail Mounting |
| MDR-20-24 | 24 $V_{DC}$/1.0 A, 24 W Power Supply with DIN-Rail Mounting |
| MDR-60-24 | 24 $V_{DC}$/2.5 A, 60 W Power Supply with DIN-Rail Mounting |


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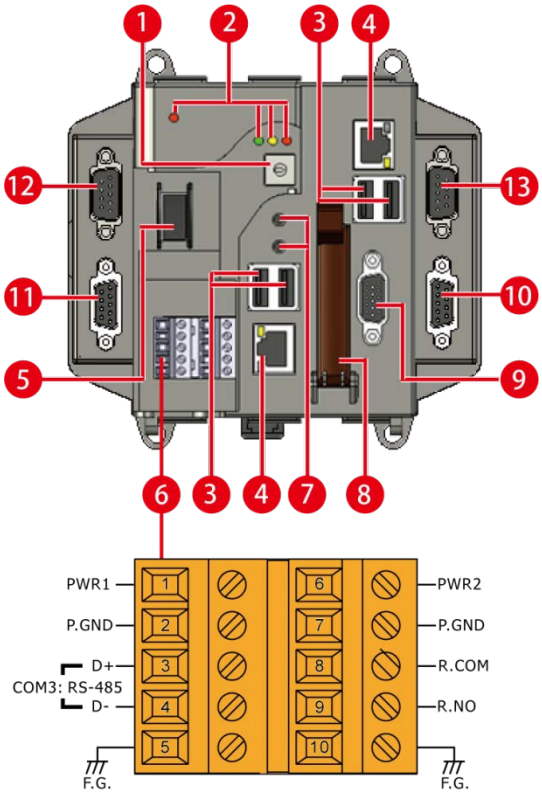
# 1.3. Overview

The XP-8000-Atom contains several interfaces and peripherals that can be integrated with external systems. Here is an overview of the components and storage, and its descriptions. The following list shows the details of the components and storage:

## Components

### XP-8041-Atom





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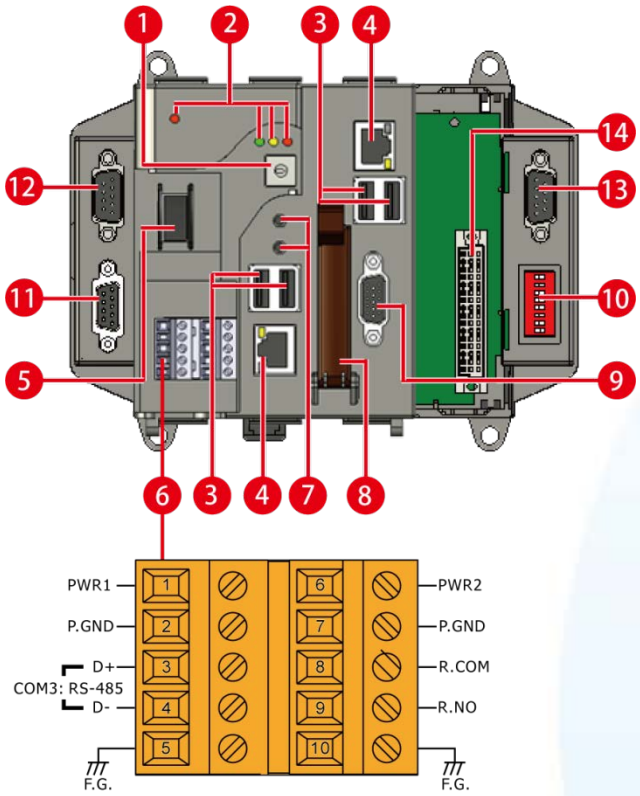
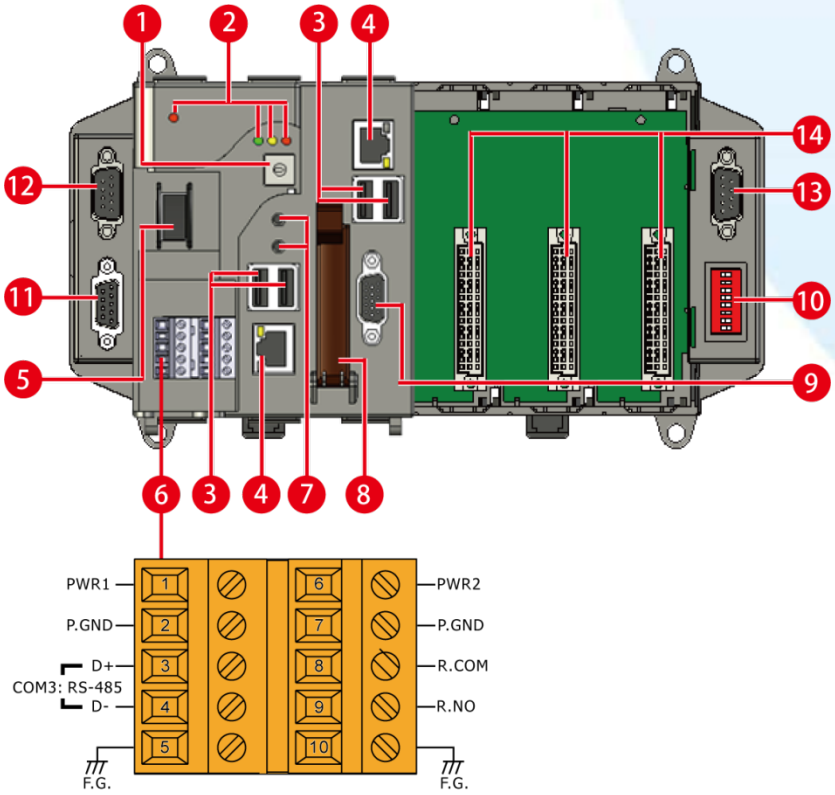
## XP-8141-Atom




## XP-8341-Atom





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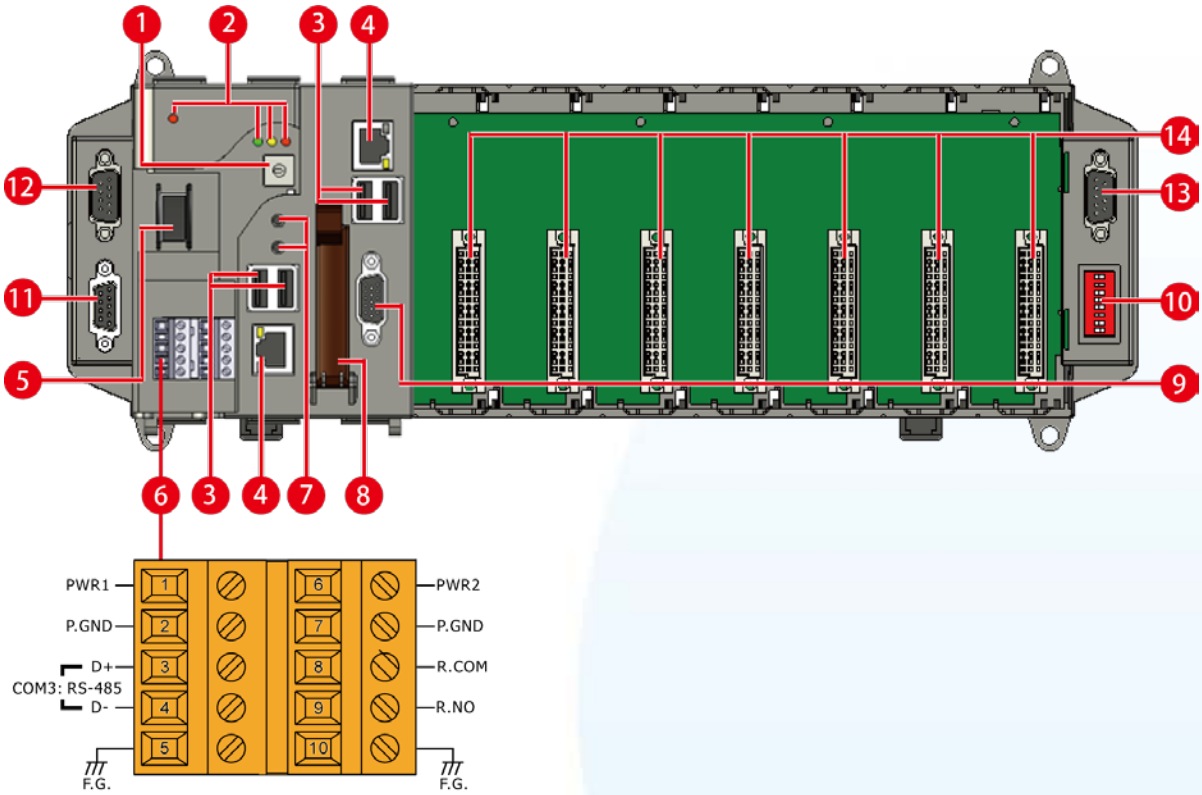
## XP-8741-Atom





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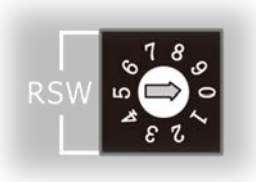
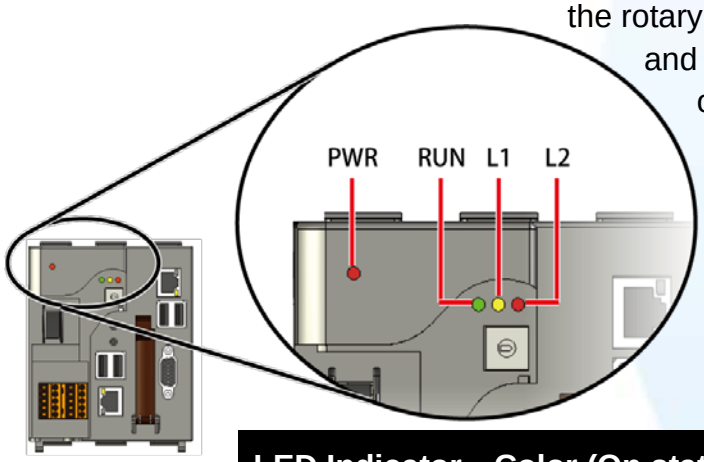
## 1. Rotary Switch




The Rotary Switch is an operating mode selector switch which provides functions to configure with the selection of operating mode and authorization control.

## 2. LED Indicators

The XP-8000-Atom contains four LED indicators. The first is labeled PWR, located near the power switch and shows the power status. The three other are located next the rotary switch, the left one is labeled RUN and shows the operation status, the two other are denoted L1 and L2 and used for user defined.




| LED Indicator | Color (On state) | Meaning |
|---|---|---|
| PWR | Red | Power is on |
| RUN | Green | OS is running |
| L1 | Yellow | User programmable LED |
| L2 | Red | User programmable LED |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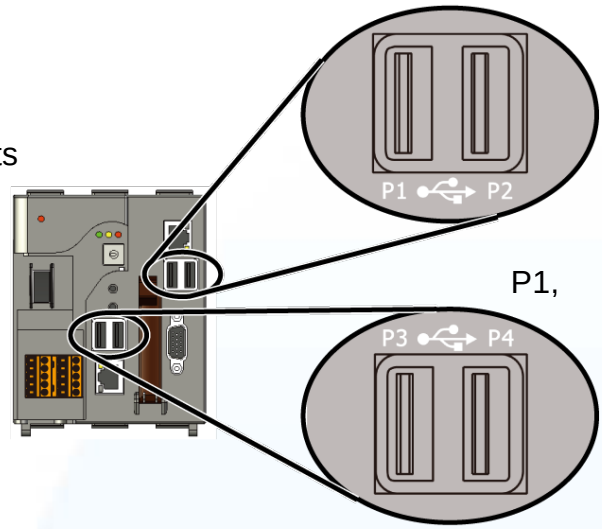
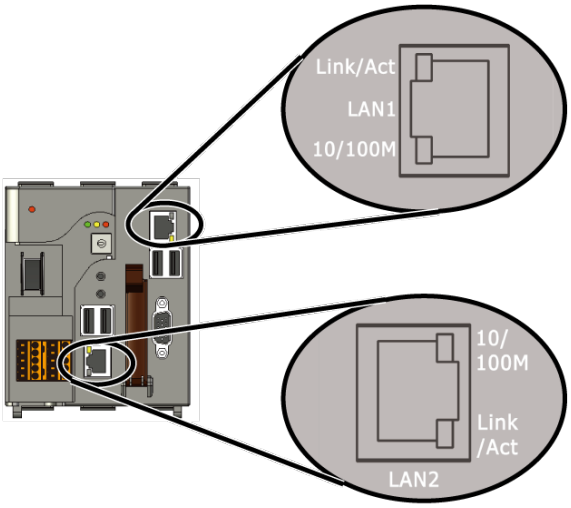
## 3. USB Ports (P1 ~ P4)

The XP-8000-Atom contains four USB ports that allow support for the USB devices such as mouse, keyboard or an external USB hard drive. These ports are denoted P2, P3 and P4.

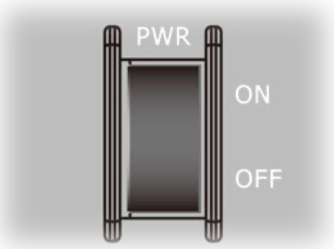



P1,




## 4. Ethernet Port (LAN1, LAN2)

The XP-8000-Atom contains two Ethernet ports for use with network devices, and are denoted as LAN1 and LAN2.




## 5. Power Switch

The power switch is a small switch that enables or disables power to electric circuits and loads in the XP-8000-Atom.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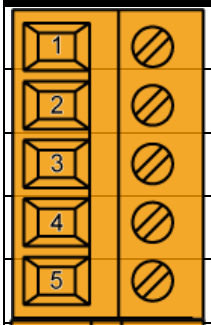
## 6. Connector

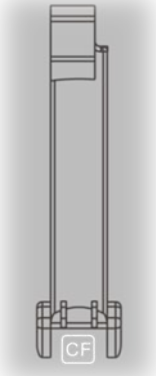
The connector has 10 pins arranged in 2 rows, as follows:

The pin assignments of the connector are as follows:

| Pin | | Signal | Description |
|---|---|---|---|
|  | 1 | **PWR1** | Power input 1 |
| | 2 | **P.GND** | |
| | 3 | **D+** | COM3: RS-485 |
| | 4 | **D-** | |
| | 5 | **F.G.** | Frame ground |
| | 6 | **PWR2** | Power input 2 |
| | 7 | **P.GND** | |
| | 8 | **R.COM** | Relay output |
| | 9 | **R.NO** | |
| | 10 | **F.G.** | Frame ground |

## 7. Microphone and Earphone Jacks

The XP-8000-Atom contains the microphone and earphone jack to the input and output of sound system.




## 8. CF Card Expansion Slot

The CF card expansion slot is an interface that is used to access and download information on a CF card to a XP-8000-Atom. The CF card can be used to expand the memory up to 32 GB.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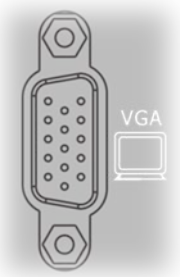



## 9. VGA Connector

A VGA connector is a 3-row 15-pin connector that can be used with a variety of supported VGA resolutions, ranging from 640 x 400 to 1400 x 1050 px.

## 10. COM1 (Only for XP-8041-Atom)

**Port Type**: Female

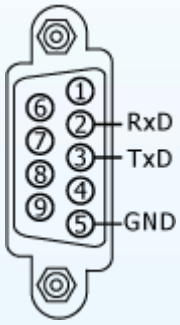
**Baud Rate**: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps

**Data Bits**: 5, 6, 7, 8

**Parity**: None, Even, Odd, Mark (Always 1), Space (Always 0)

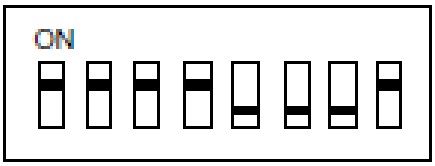
**Stop Bits**: 1, 2

**FIFO**: 16 bytes




## 10. DIP Switch (For XP-8141-Atom, XP-8341-Atom and XP-8741-Atom)

The DIP switch can be used to set the Module ID to a number from 0 to 255. Do not use Module ID 0 for communication.





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## 11. COM2 (RS-232)

**Port Type**: Female

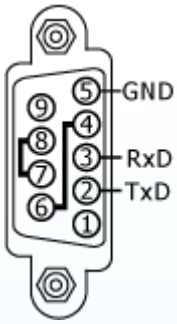
**Baud Rate**: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps

**Data Bits**: 7, 8

**Parity**: None, Even, Odd

**Stop Bits**: 1

**FIFO**: 1 byte



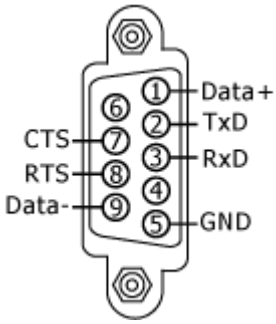

## 12. COM4 (RS-232/RS-485)

**Port Type**: Male

**Baud Rate**: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps

**Data Bits**: 5, 6, 7, 8

**Parity**: None, Even, Odd, Mark (Always 1), Space (Always 0)




COM4 can be configured as either RS-232 or RS-485, that only can select one at a time and its configuration depends on the pin connections as follows:

**RS-232** (RXD, TXD, CTS, RTS and GND)

**RS-485** (Data+ and Data-)

There is no software configuration or hardware jumper needed.

## 13. COM5 (RS-232)

**Port Type**: Male

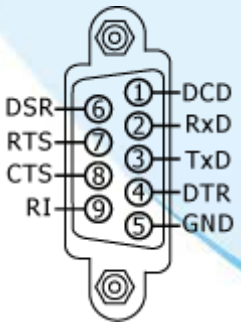
**Baud Rate**: 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200 bps

**Data Bits**: 5, 6, 7, 8

**Parity**: None, Even, Odd, Mark (Always 1), Space (Always 0)

**Stop Bits**: 1, 2

**FIFO**: 16 bytes



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## 14. I/O Slots

The XP-8000-Atom contains some extra I/O slots except the XP-8041-Atom. The XP-8000-Atom use I/O slots that can be expanded. They can serve in local and local expansion. The number of each type of the expansion I/O slot:

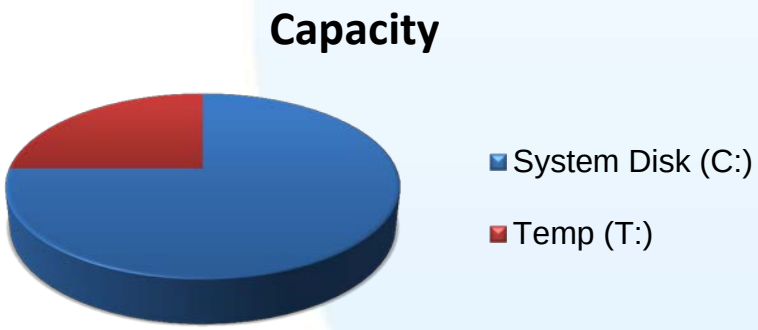
XP-8141: 1 I/O slot

XP-8341: 3 I/O slots

XP-8741: 7 I/O slots

## Storage

- **Built-in Flash Disk**




**System Disk (C:)**

This partition, protected by EWF, contains OS, services, and applications. All manipulations of this device are operated on this partition.

**Temp (T:)**

This partition, unprotected by EWF, stores the event logs and temporary files.

- **Compact Flash (CF HOT PLUG Unsupported)**

**Data Disk (D:)**

The default letter of compact flash is [D] and unprotected by EWF.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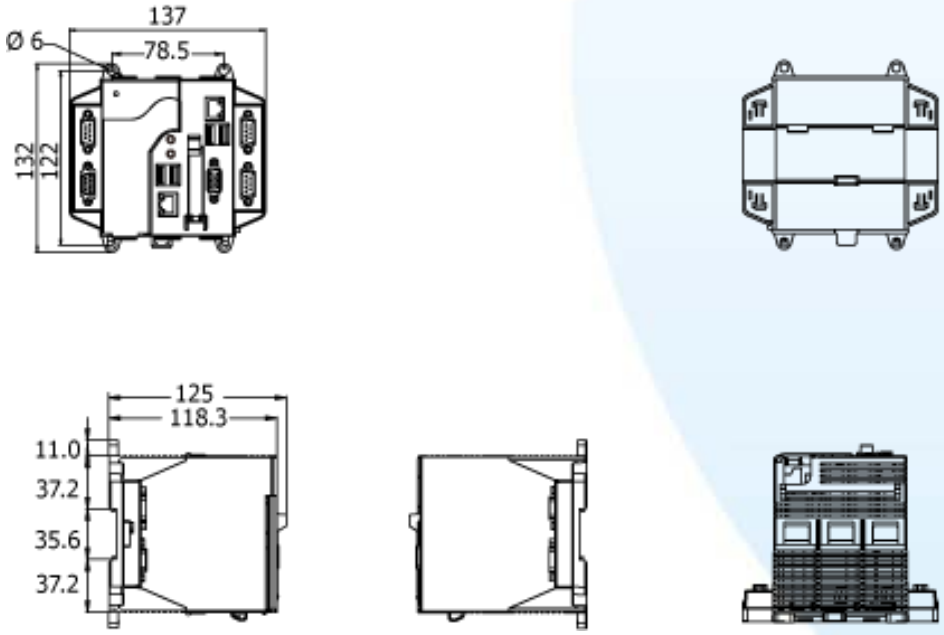
# 1.4. Dimension

The diagrams below provide the dimensions of the XP-8000-Atom to use in defining your enclosure specifications. Remember to leave room for potential expansion if you are using other components in your system.

The height dimension is the same for all XP-8000-Atom. The width depending on your choose of I/O expansion slots. All dimensions are in millimeters.

## XP-8041-Atom





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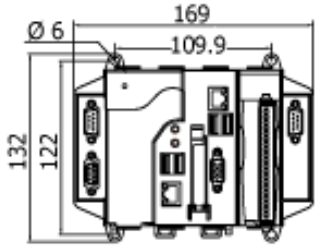
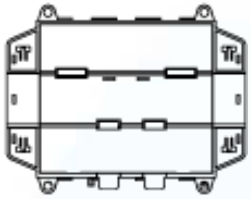
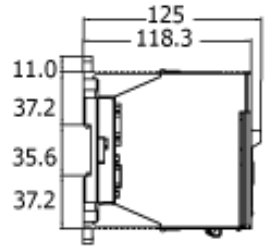
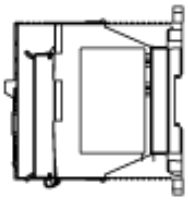
## XP-8141-Atom

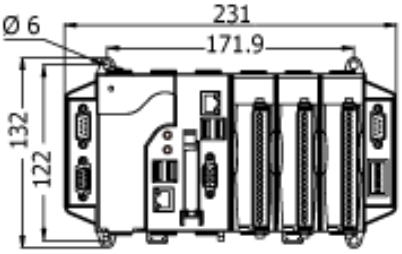


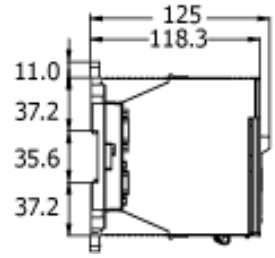



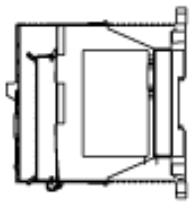


## XP-8341-Atom





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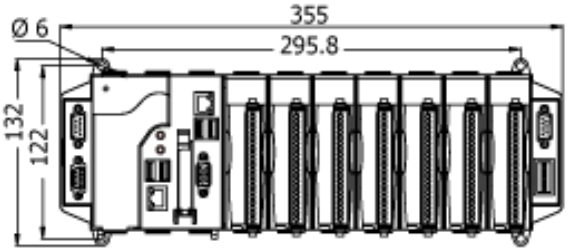

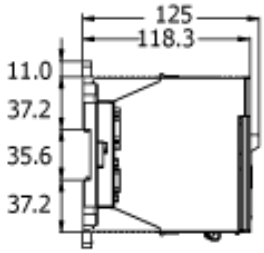


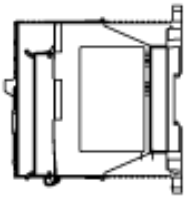

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# 1.5. Companion CD

This package comes with a CD that provides a collection of the software utility, documentation, drivers, demo program and application. The CD contains several subdirectories located in \XP-8000-Atom\ directory. All of them are listed below.

- CD:\XPAC-Atom\
  - Demo
    - The demo programs for examples of use in the application.
  - Document
    - The technical support documents for installation, operation, maintenance, development and application.
  - Driver
    - The driver for the hardware .
  - OS_image
    - The OS image for disaster recovery.
  - Rescue_Disk
    - The files for system backups and restores.
  - SDK
    - The sources for development and application in your application.
  - Update
    - The files for the System Disk of the XP-8000 side.
  - Tools
    - The related information for I/O and XP-8000 releases.

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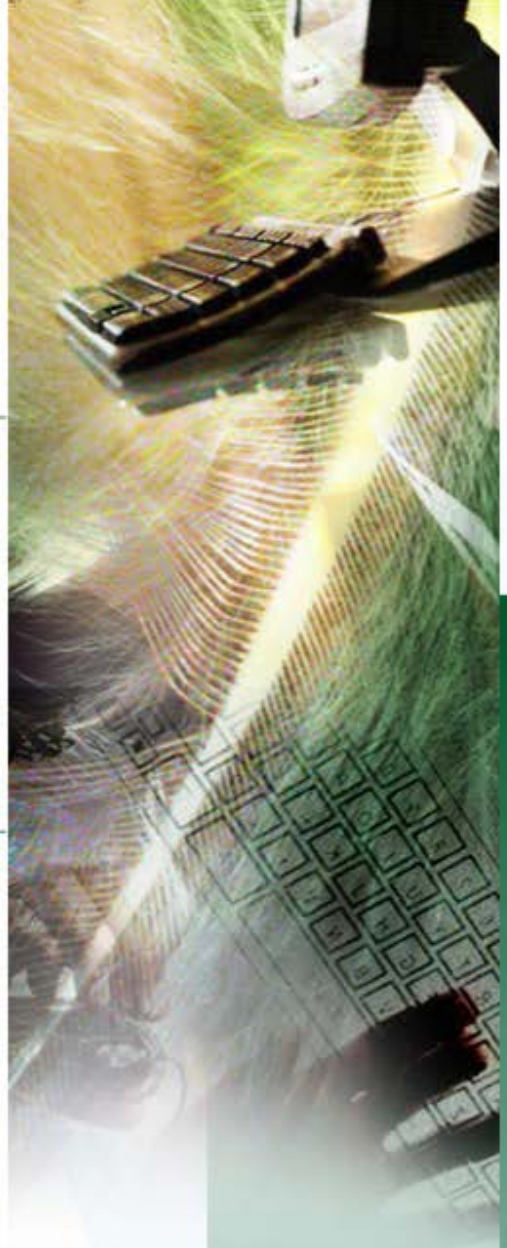

# 2. Getting Started

This chapter provides a guided tour that describes the steps needed to download, install, configure, and run the basic procedures for user working with the XP-8000-Atom for the first time.


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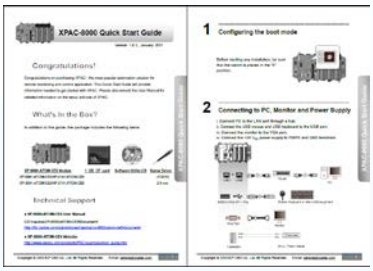
Before starting any task, please check the package contents. If any of the following package contents are missing or damaged, contact your dealer, distributor.

**XP-8000-Atom Series Module**



**Quick Start Guide**

**Software Utility CD**

**Screw Driver (1C016)**



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# 2.1. Mounting the Hardware

Before you work with the XP-8000-Atom, you should have a basic understanding of hardware specification, such as the dimensions, the usable input-voltage range of the power supply, and the type of communication interfaces.

For more information about the hardware details, see section 1.2., “Specifications.”

For more information about the hardware dimensions, see section 1.4., “Dimension.”


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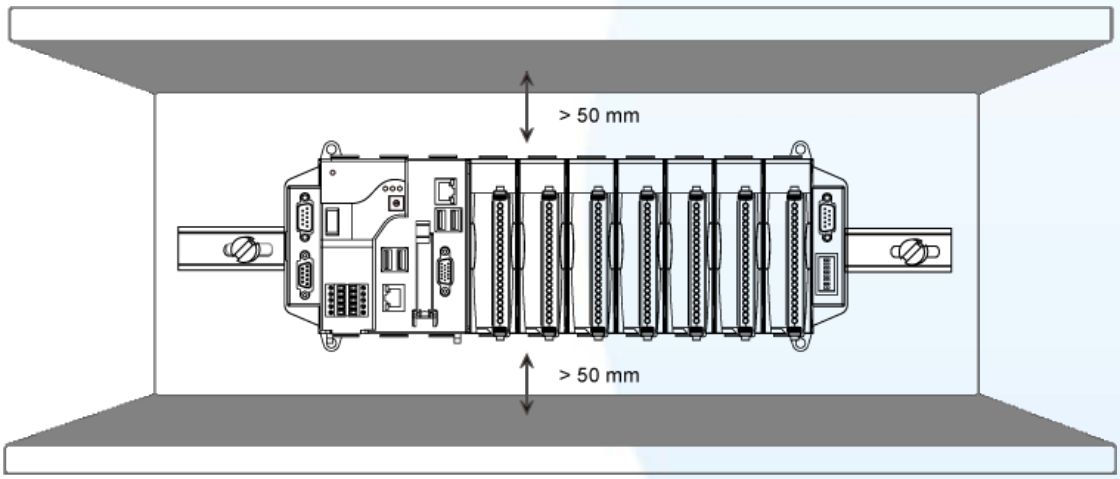
# 2.1.1. Mounting the XP-8000-Atom

The XP-8000-Atom can be mounted with the bottom of the chassis in the standard 35 mm DIN rail, or any other screw-mountable surface.

### Tips & Warnings

There must be a minimum clearance of 50mm between the XP-8000-Atom and the top and bottom side of the enclosure panels must be provided.





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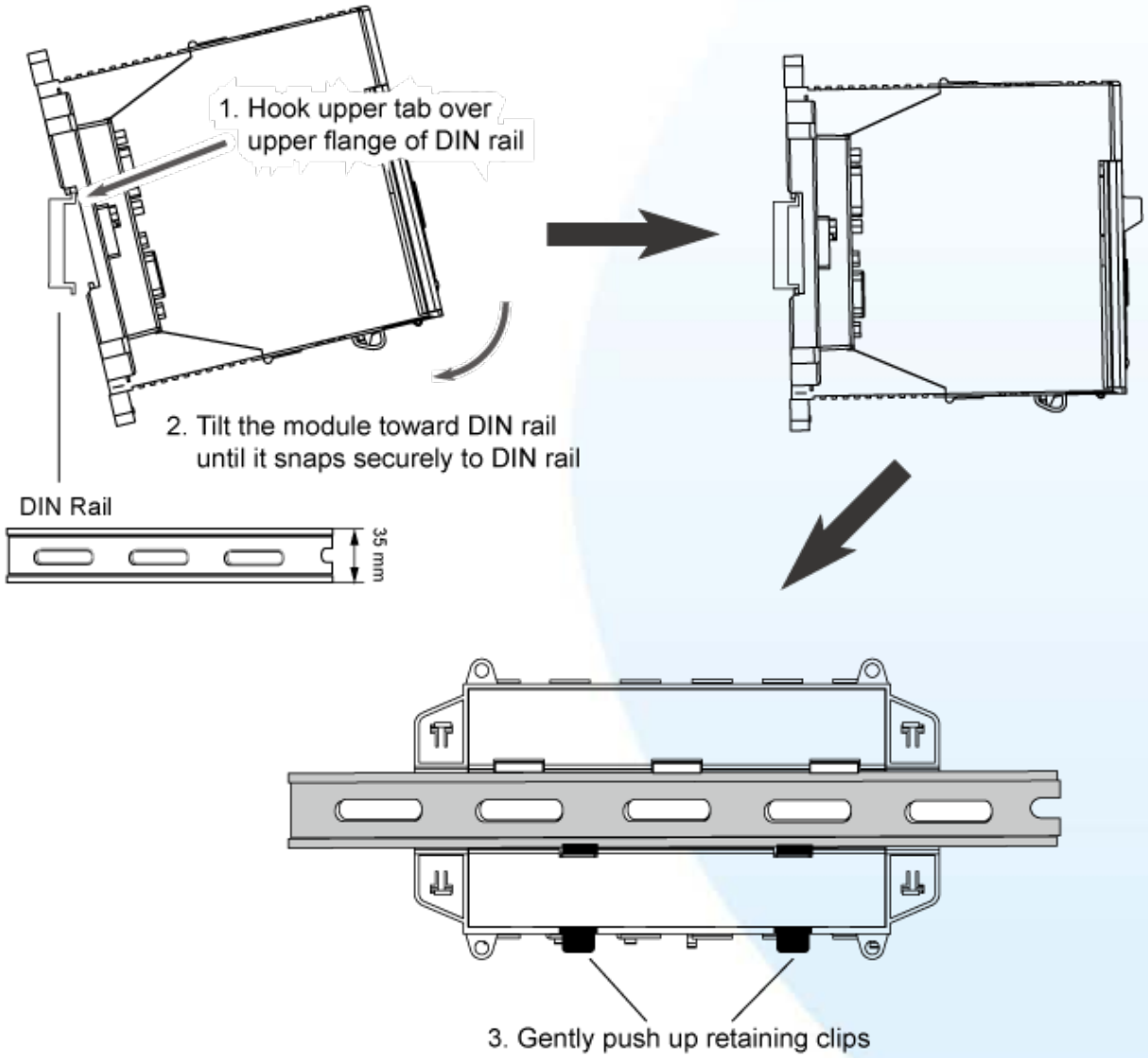
**To mount the XP-8000-Atom chassis on a DIN rail**

**1.** Hook upper tab over upper flange of DIN rail.

**2.** Tilt the module toward DIN rail until it snaps securely to DIN rail.

**3.** Push up retaining clips.


1. Hook upper tab over upper flange of DIN rail
2. Tilt the module toward DIN rail until it snaps securely to DIN rail
DIN Rail
35 mm
3. Gently push up retaining clips



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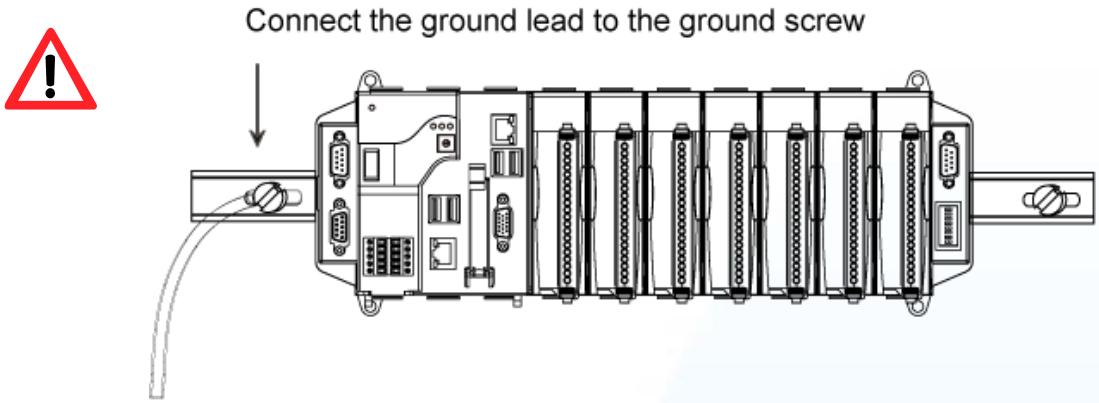
## Tips & Warnings



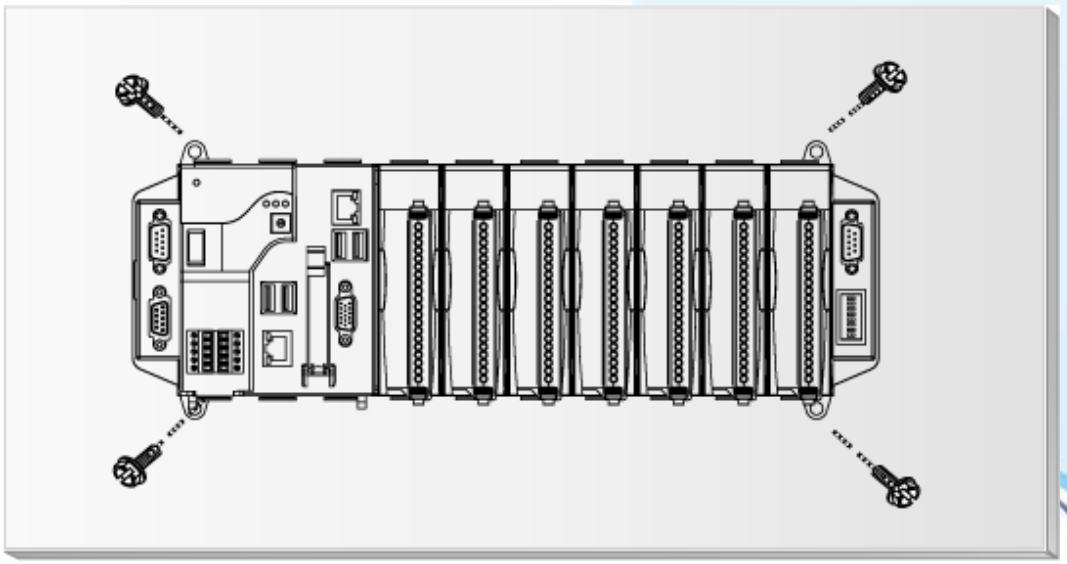

**Grounding**

A good common ground reference (earth ground) is essential for proper operation of the XP-8000-Atom. One side of all control circuits, power circuits and the ground lead must be properly connected to earth ground by either installing a ground rod in close proximity to the enclosure or by connecting to the incoming power system ground. There must be a single-point ground (i.e. copper bus bar) for all devices in the enclosure that require an earth ground.

---

**To mount the XP-8000-Atom on a surface**

1. Install the four mounting screws into the 4 keyhole mounting holes.
2. Fasten the screws securely.

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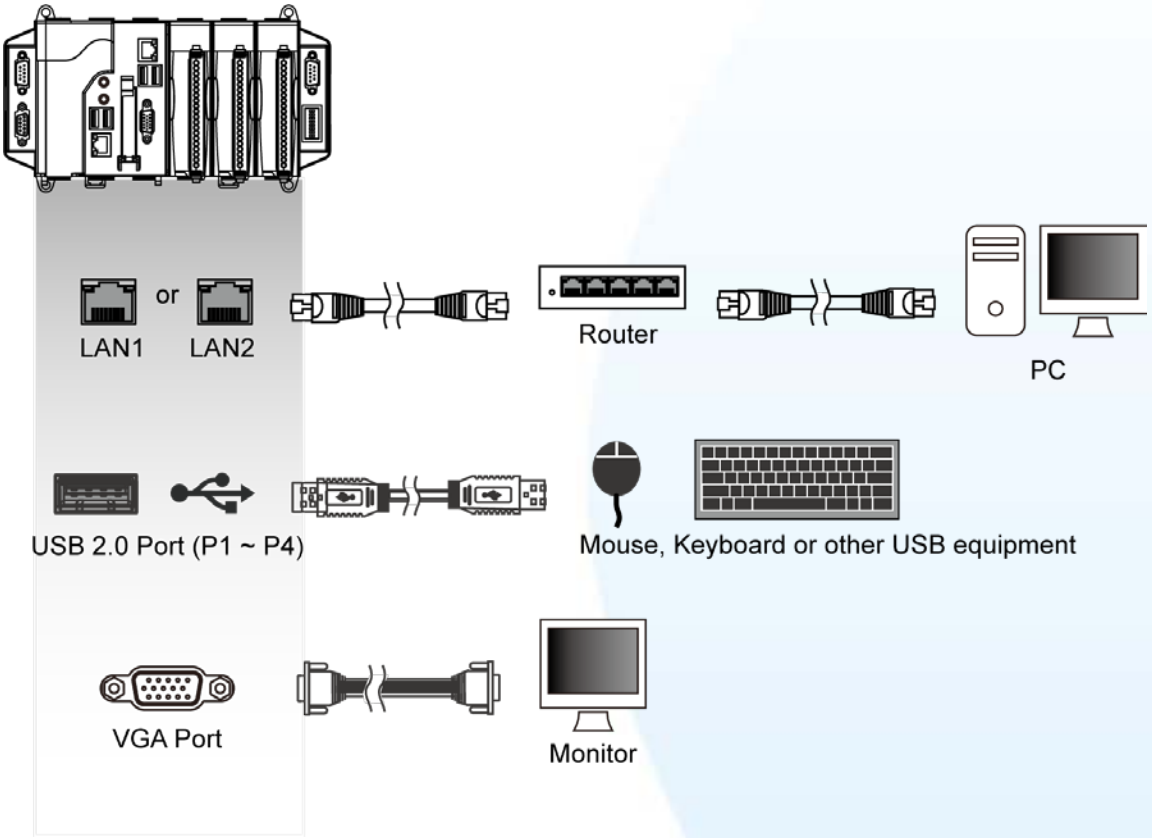
## 2.1.2. Deploying a Basic XP-8000-Atom System

The XP-8000-Atom provides a variety of interfaces to suit a range of applications.

The following illustration shows a simple application.




As the above illustration shows, the XP-8000-Atom interfaces can be used to perform the following tasks:

- Connect to PC through a router
- Connect to a USB mouse or keyboard.
- Connect to a monitor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## 2.1.3. Inserting the I/O Modules

Except for XP-8041-Atom, the XP-8000-Atom has 1/3/7 I/O expansion slots to expand the functions of the XP-8000-Atom, allowing it to communicate with external I/O modules, and before choosing the right I/O modules, you first need to know the I/O expansion capacities in order to choose the best expansion module for achieving maximal efficiency.

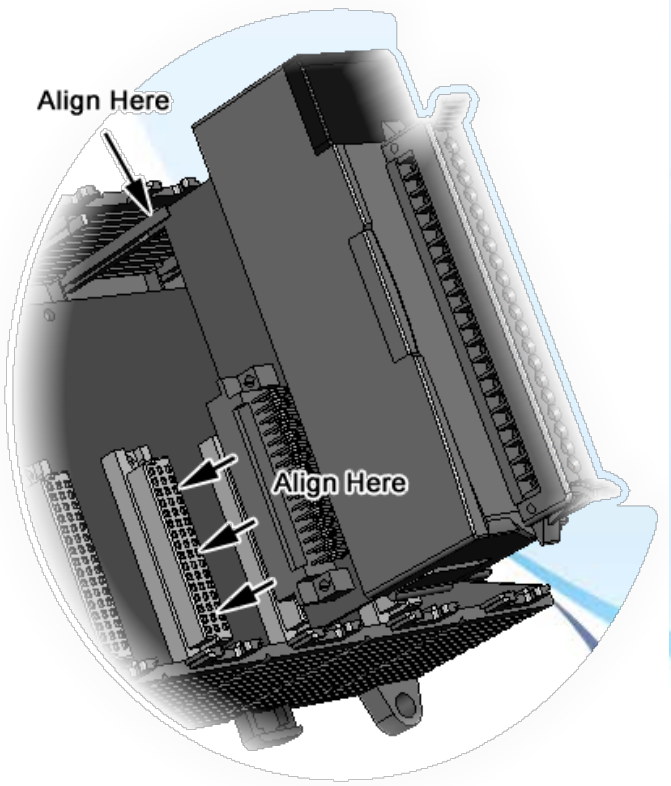
There are more than 30 high profile I/O modules available for interfacing many different measurements, including thermocouple, voltage, RTD, current, resistance, strain, digital,…, etc., and these modules have their own manuals, so if you are using them you should supplement this manual with the manual specifically designed for the special module.

For more information about the I/O expansion modules that are compatible with the XP-8000-Atom, see

http://www.icpdas.com/products/PAC/i-8000/8000_IO_modules.htm#i87

**To Insert the I/O module**

**1.** Align circuit card with slot and press firmly to seat module into connector





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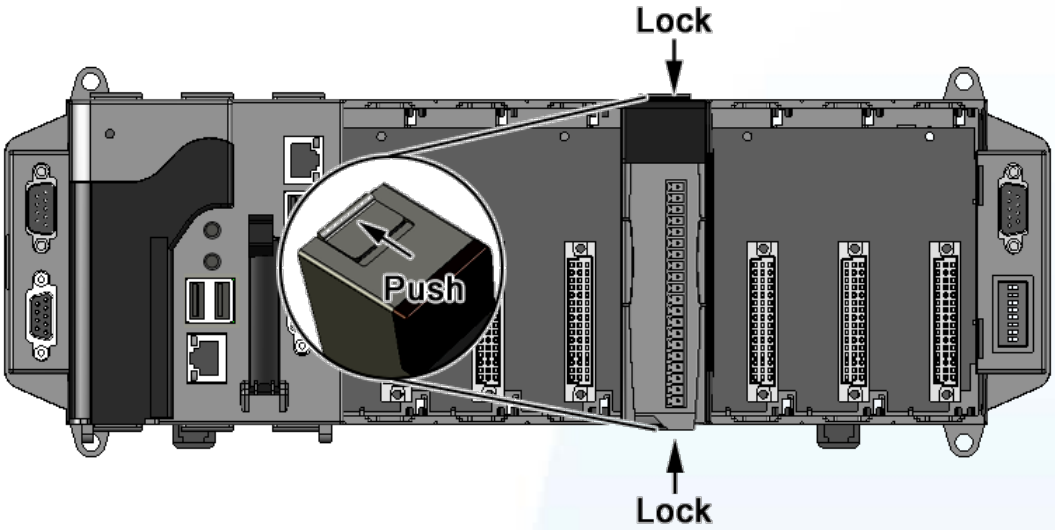
**2.** Pull top and bottom locking tabs toward module face. Click indicates lock is engaged




**3.** Attach field wiring using the terminal block, and then insert the terminal block

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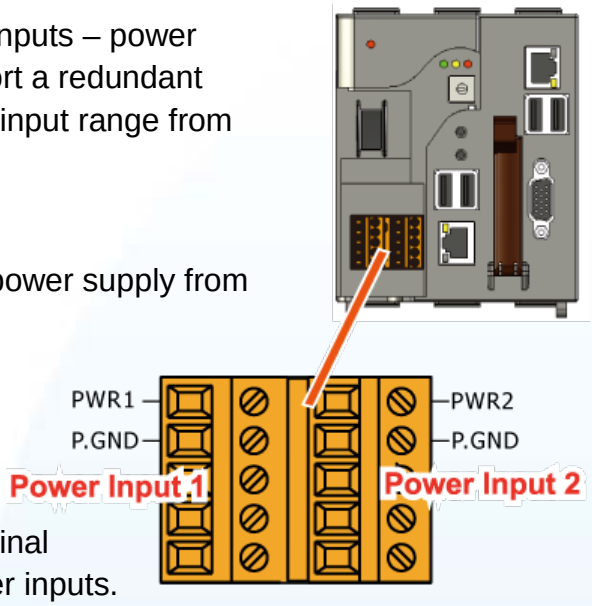
# 2.1.4. Powering up the XP-8000-Atom

The XP-8000-Atom has two sets of power inputs – power input 1 and power input 2, which can support a redundant power system and can be supplied with an input range from +10 to +30 $V_{DC}$.



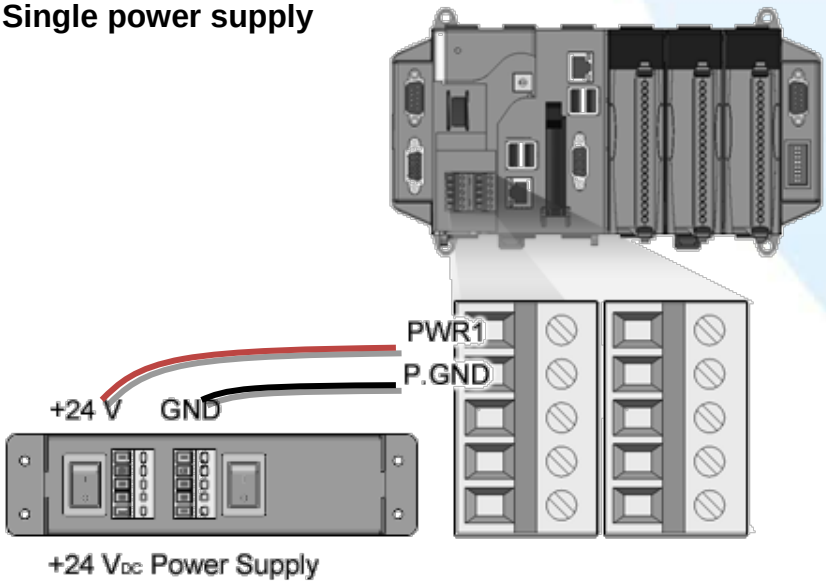

For more information about the supported power supply from the ICP DAS, see

http://www.icpdas.com/products/Accessories/power_supply/power_list.htm

The top two contacts of the two 6-pins terminal block connectors are used for the two power inputs.

There are two ways to supply power to the XP-8000-Atom.

**Single power supply**





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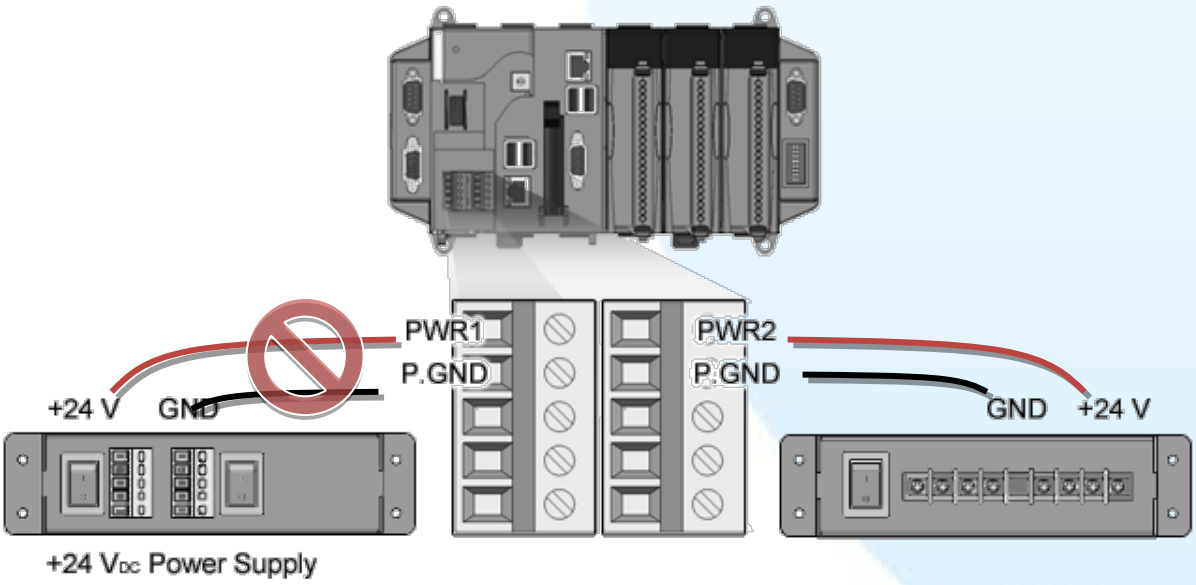
## Tips & Warnings

Once you wire and power up the power supply, confirm the PWR indicator (Red LED) on the CPU module is on.

If the indicator is not on, check the voltage on the terminal block with a voltage meter. If you measure 24 VDC on the terminal block, the CPU module may be defective. Please contact us.

### Redundant power supply

The redundant power can be used single and used two self-governed power to supply to the system, PWR1 and PWR2 input at the same time, when one power fails, the other power acts as a backup, and automatically supplies power needs.





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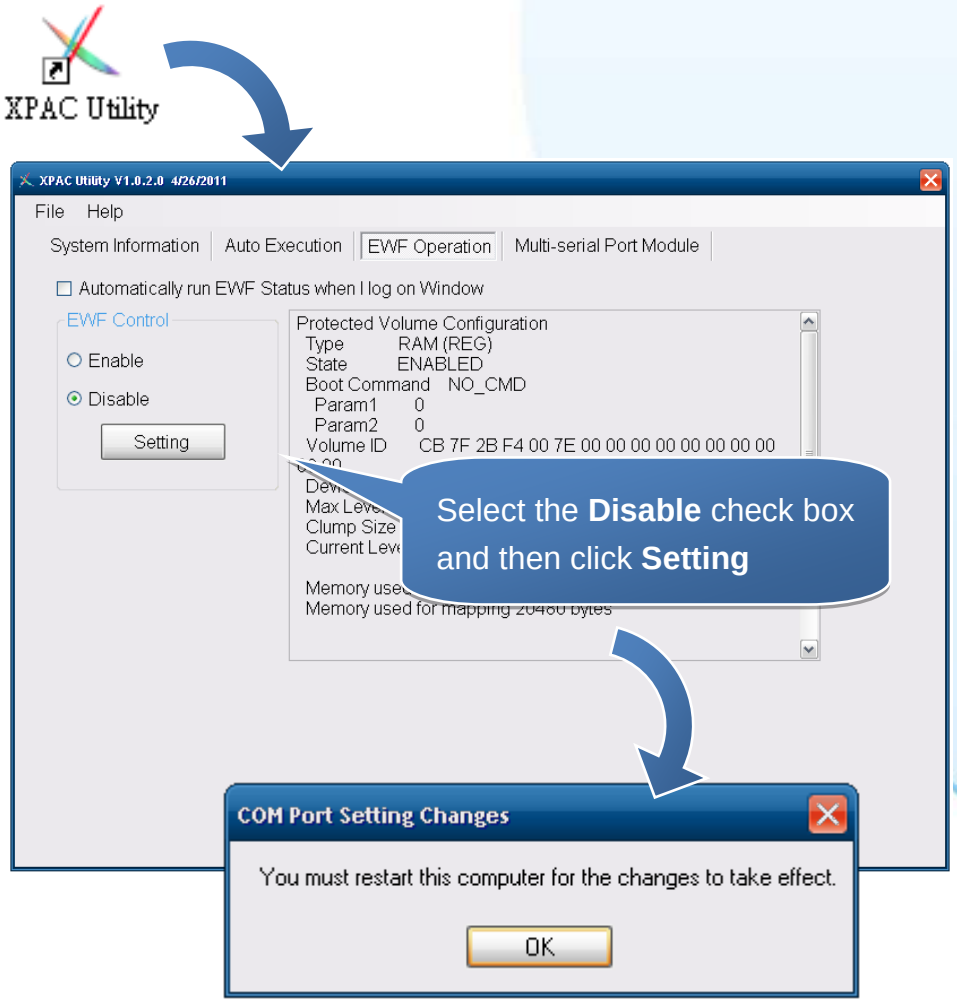
## 2.2. Disabling EWF to Allow Settings to Be Saved

The EWF is a safety mechanism on XP-8000-Atom for protecting the system from virus infection and harsh environments. Before installing application or modifying system settings, EWF needs to be disabled; after the operation completed, EWF needs to be enabled. When EWF is enabled, the modification on C disk will be invalid at the next reboot.

**To save the settings change EWF status**

1. Double-click the **XPAC Utility** shortcut on the desktop, and then click the **EWF operation** tab
2. Under **EWF Control**, select the **Disable** check box, and then click **Setting**
3. In the pop-up dialog box, click **OK**, and then reboot the XP-8000-Atom





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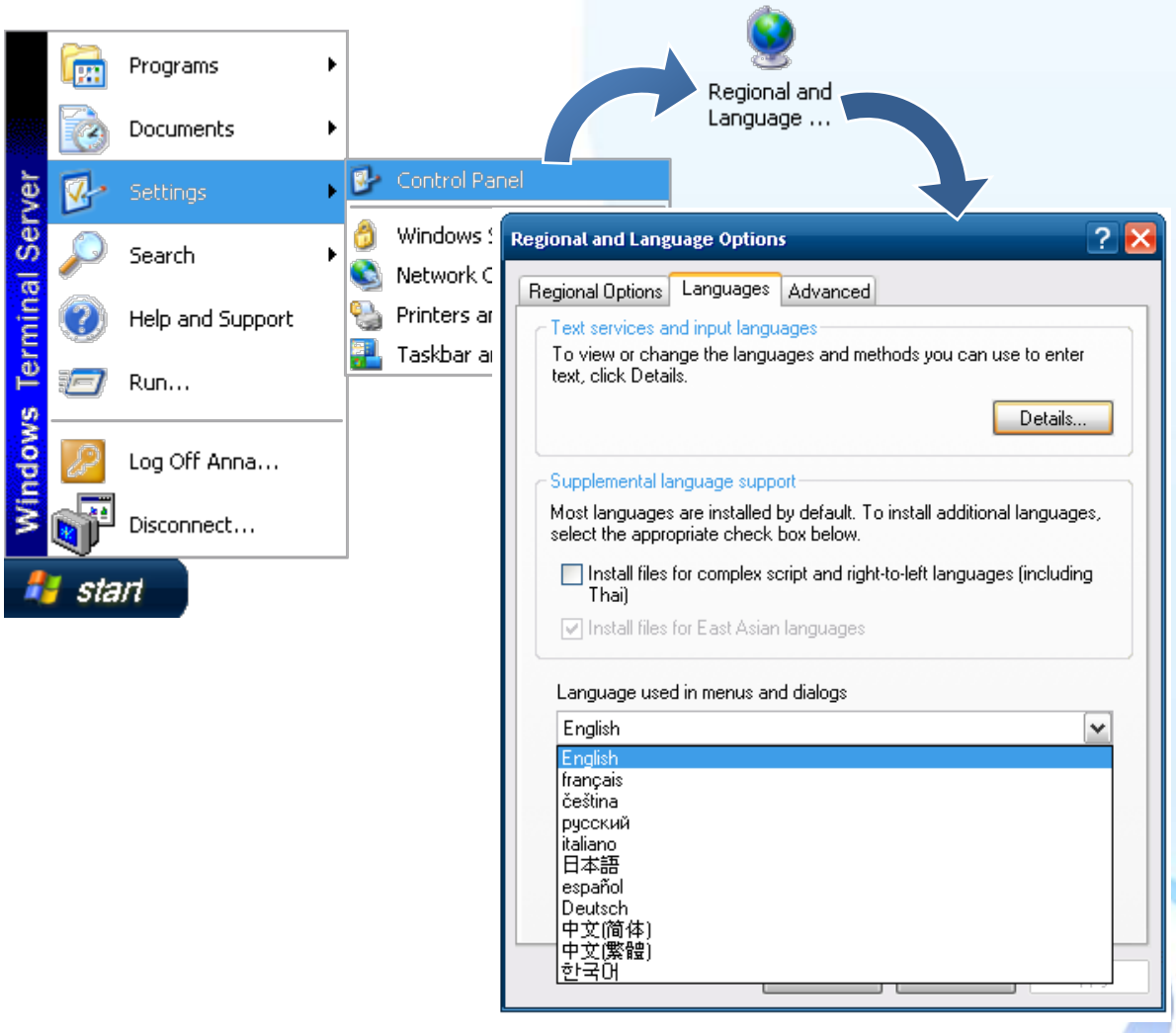
# 2.3. Changing the User Interface Language

The Regional Settings is a Windows functionality that allows users to easily change the XP-8000-Atom user interface with your native language.

**To change the XP-8000-Atom user interface language**

1. Click **Start** menu, point to **Settings**, and then click **Control Panel**
2. Double-click the **Regional and Language Options**, and then click **Languages** tab
3. In the **Language used in menus and dialogs** box, click the down arrow and select the language that you want to use for XP-8000-Atom menus and dialogs. Click **OK**.





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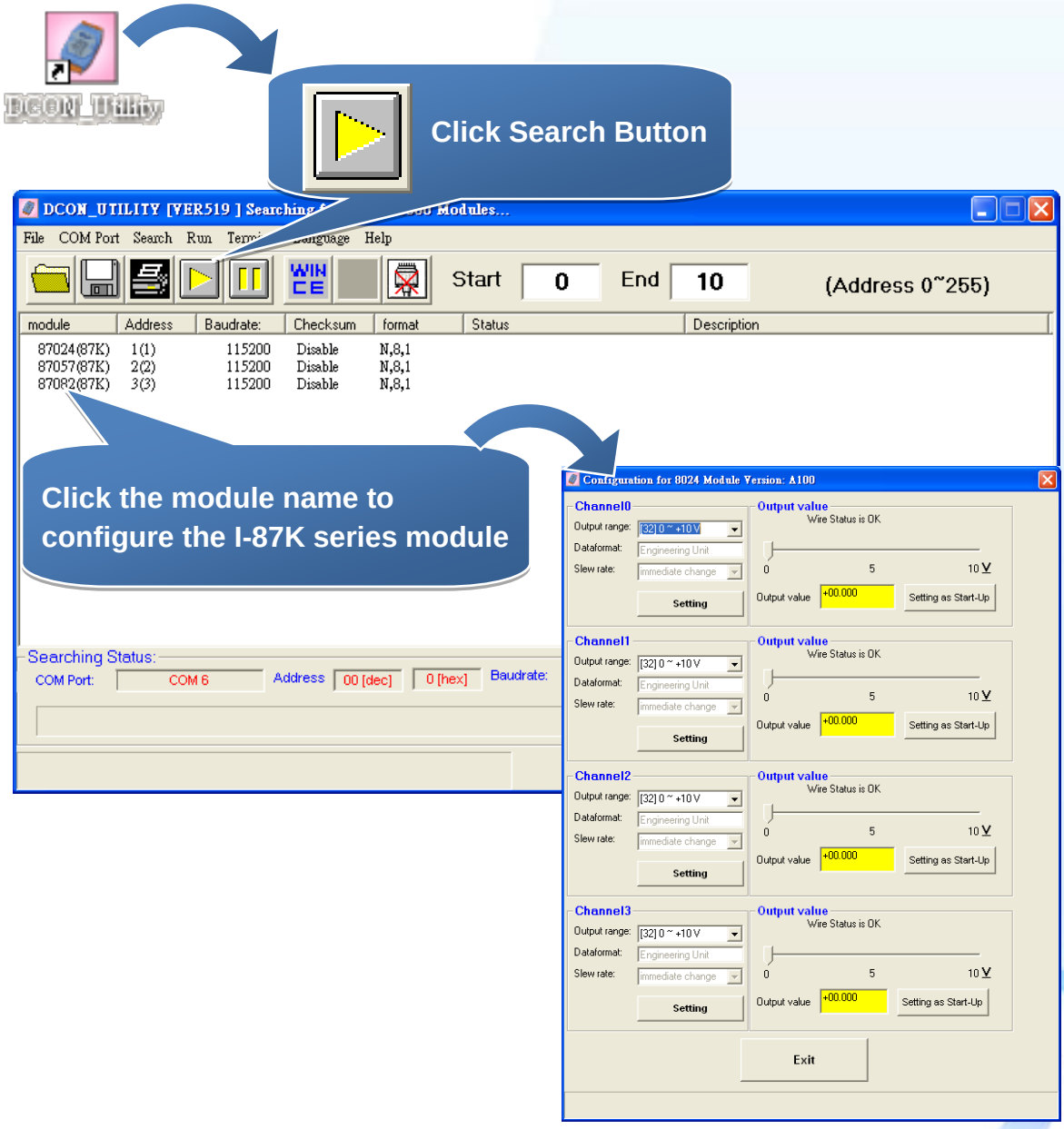
# 2.4. Using DCON Utility to Configure the I/O Module

DCON Utility is a tool kit used to quickly control and manage I-87K series expansion I/O modules.

**To use DCON Utility to configure the I/O modules**

1. Double-click **DCON Utility** shortcut on the desktop
2. Click the **Search** button
3. Click the module name to configure the I-87K series module





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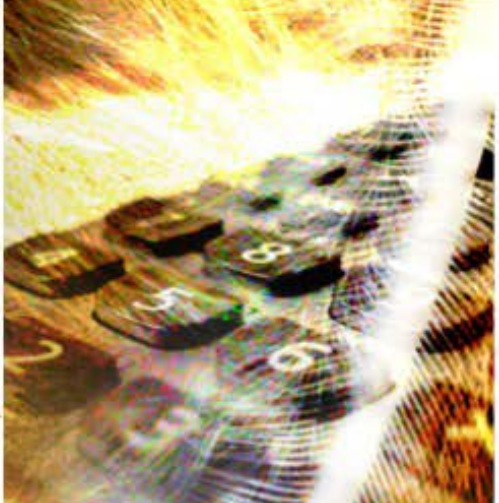

# 3. Security and Risk

This chapter provides information of technological security risks and solutions associated with XP-8000-Atom services.


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Security is important for your XP-8000-Atom. Based on Windows XP Embedded, XP-8000-Atom can avoid many security vulnerabilities. The following provides some security policy that you should consider before you develop your XP-8000-Atom.

- Windows User Accounts
- Windows Firewall
- IIS (Internet Information Service)
- EWF (Enhanced Write Filter)
- SQL Server

The following table provides the default settings of XP-8000-Atom security policy.

| Security Item | Default Settings | User Name | Password |
|---|---|---|---|
| User Accounts | Enable | Administrator | Blank |
| Firewall | Enable | N/A | N/A |
| IIS | Enable | anonymous | Blank |
| EWF | Enable | N/A | N/A |
| SQL Server | Disable | sa | icpdas |


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# 3.1. Creating and Configuring User Accounts

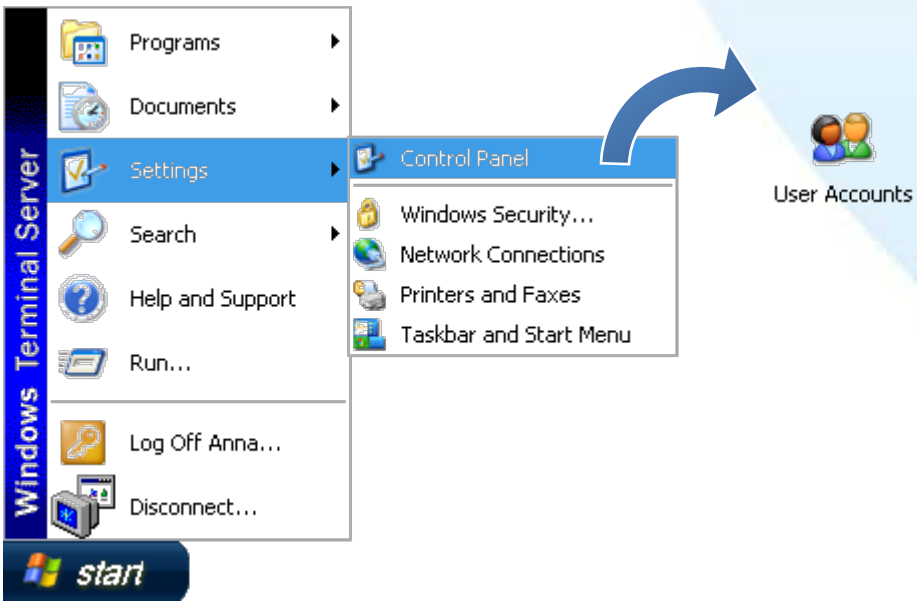
Based on Windows XP Embedded, XP-8000-Atom includes several components for managing user account names, groups, and passwords.

- The Administrator Account component allows you to specify the password for the local Administrator account. You can only include one Administrator Account component in your configuration.
- The User Account component allows you to specify the user name, group, and password for a local user account. You must add a separate User Account component for each user in your configuration.
- Additional components are required if you want to provide end-user access to account settings, passwords, and display names in User Accounts in Control Panel.

If you do not add the Administrator Account component, the run-time image is created with a single user account with full administrative privileges. The account name is Administrator and the password is blank.

**To open the user account tool**

1. Click **Start** menu, point to **Settings**, and then click **Control Panel**
2. Double-click the **Users Accounts**





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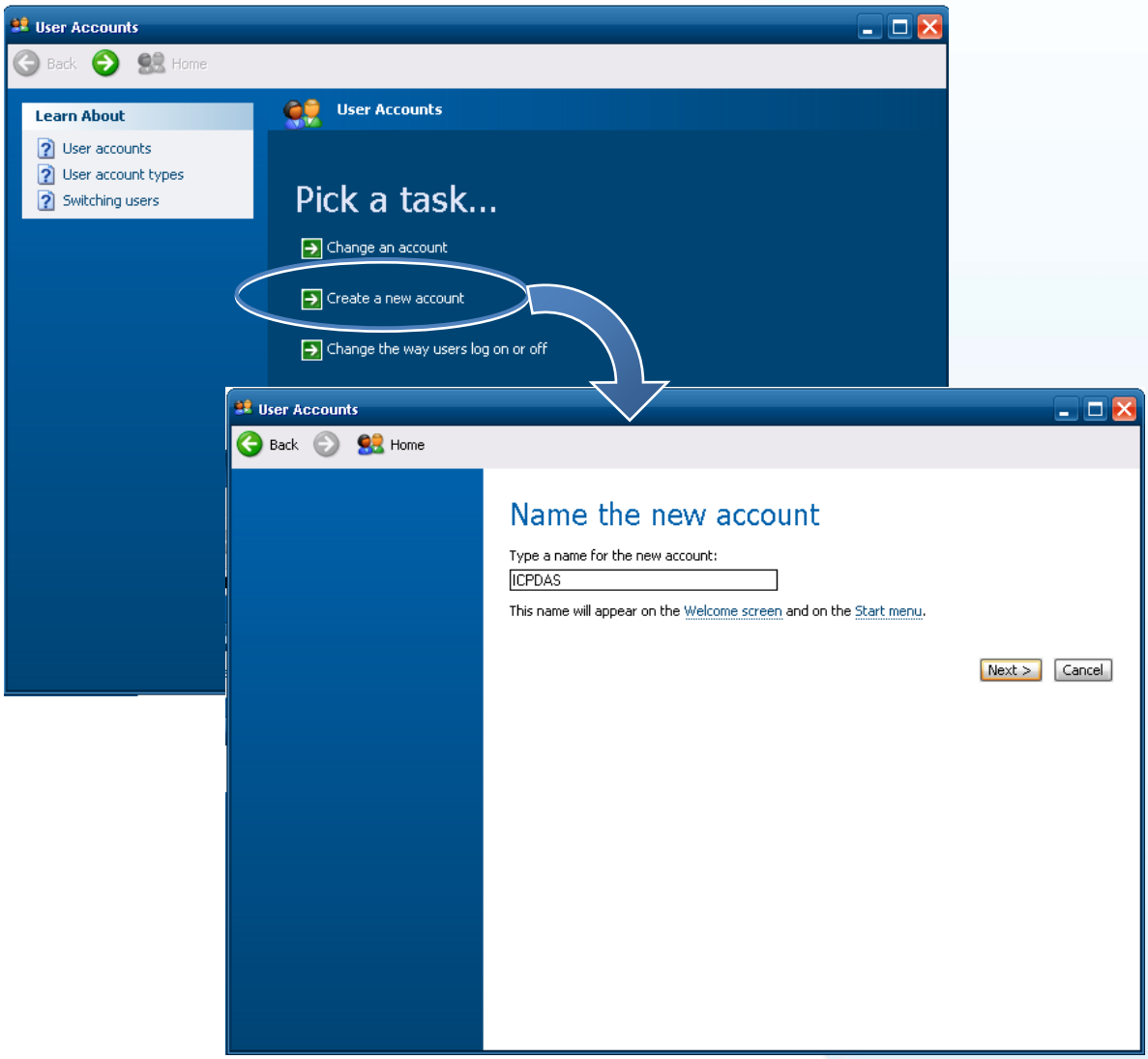
**To create a new use account**

1. Click **Create a new account** in the **Pick a task** list box
2. Type the name that you want to use for the account, and then click **Next**
3. Select the desired account type, and then click **Create Account**





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**To Make Changes to an Account**

1. Click **Change an account** in the **Pick a task** list box.
2. Click the account that you want to change.
3. Select the item that you would like to change:
   - Click **Change the name** to change the name that appears on the Welcome screen for the account.
   - Click **Change the picture** to change the picture that is used to represent the user account. You can use any image file on the computer for the user's picture.
   - Click **Change the account type** to change the account type to increase or decrease the user's rights on the computer.
   - Click **Create/change the password** to create or change the password for the user and create or change the password hint.
   - Click **Delete the account** to delete the user account from the computer. When you delete the account, you are given the option to save the user's files on the computer.

**Tips & Warnings**

You cannot delete the account for a user that is currently logged on to the computer.


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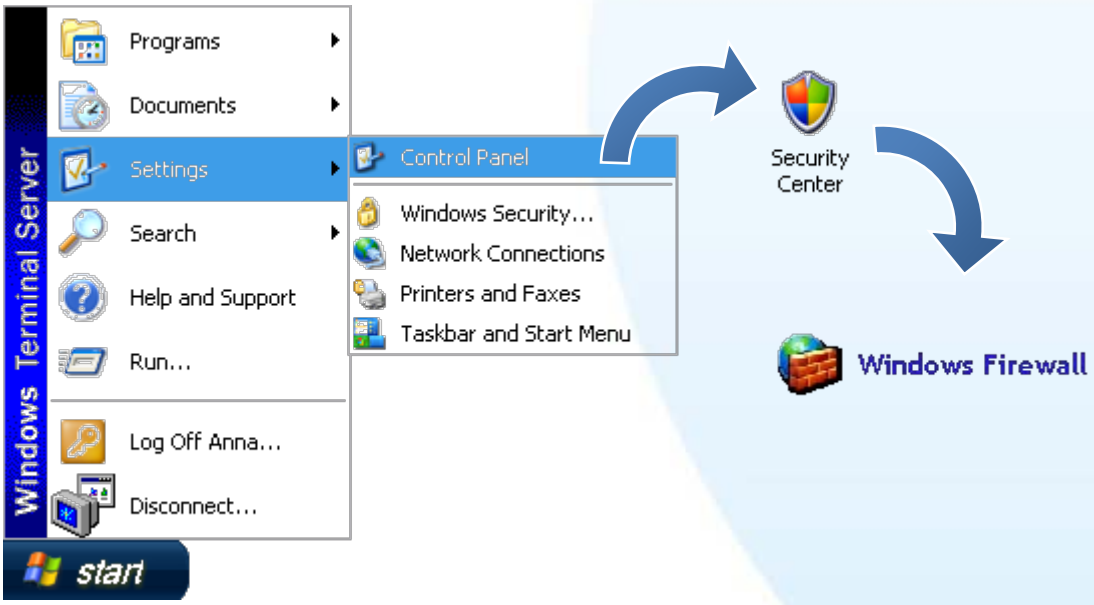
# 3.2. Turning Firewall On or Off

Based on Windows XP Embedded, XP-8000-Atom Firewall with Advanced Security and the related firewall technologies documented here enable developers to share Internet connections, protect connections using a firewall, and provide Network Address Translation (NAT).

**To open the firewall tool**

1. Click **Start** menu, point to **Settings**, and then click **Control Panel**
2. Double-click the **Security Center**, and then click **Windows Firewall**





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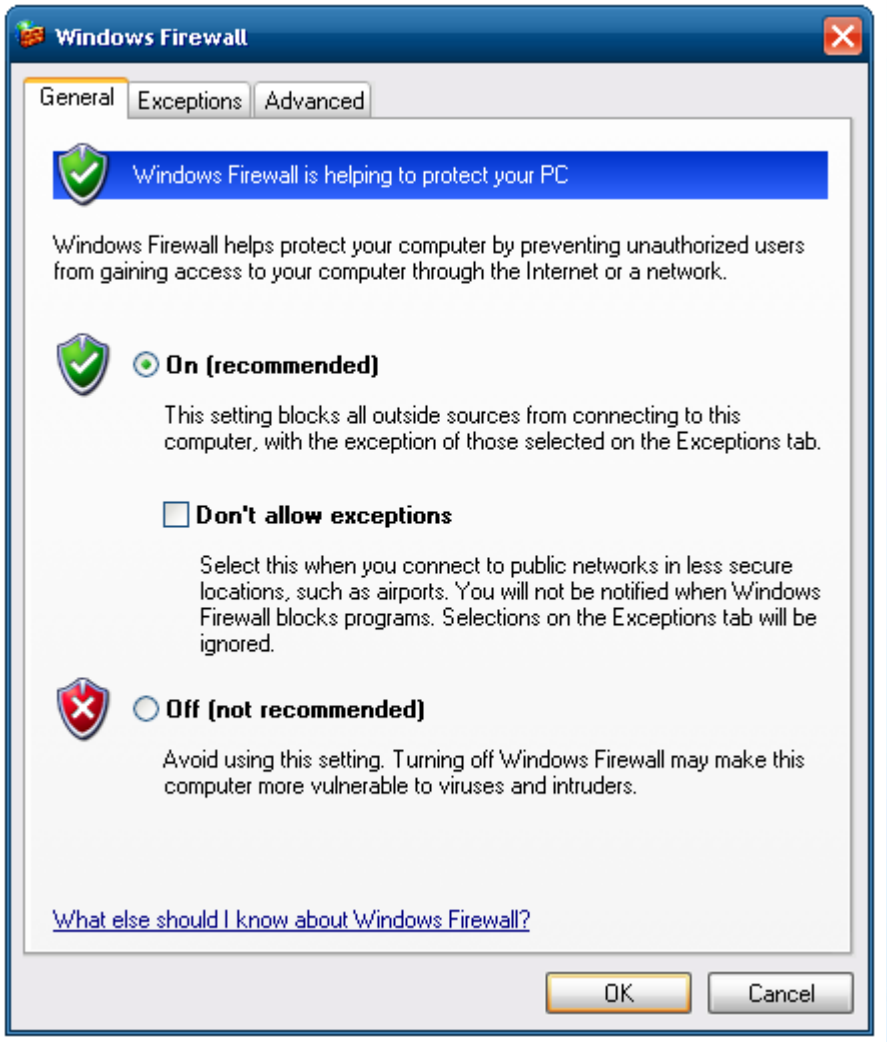
**To turn on the firewall**

In the **Windows Firewall** dialog box, click **On (recommended)**, and then click **OK**


Windows Firewall
General
Exceptions
Advanced
Windows Firewall is helping to protect your PC
Windows Firewall helps protect your computer by preventing unauthorized users from gaining access to your computer through the Internet or a network.
On (recommended)
This setting blocks all outside sources from connecting to this computer, with the exception of those selected on the Exceptions tab.
Don't allow exceptions
Select this when you connect to public networks in less secure locations, such as airports. You will not be notified when Windows Firewall blocks programs. Selections on the Exceptions tab will be ignored.
Off (not recommended)
Avoid using this setting. Turning off Windows Firewall may make this computer more vulnerable to viruses and intruders.
What else should I know about Windows Firewall?
OK
Cancel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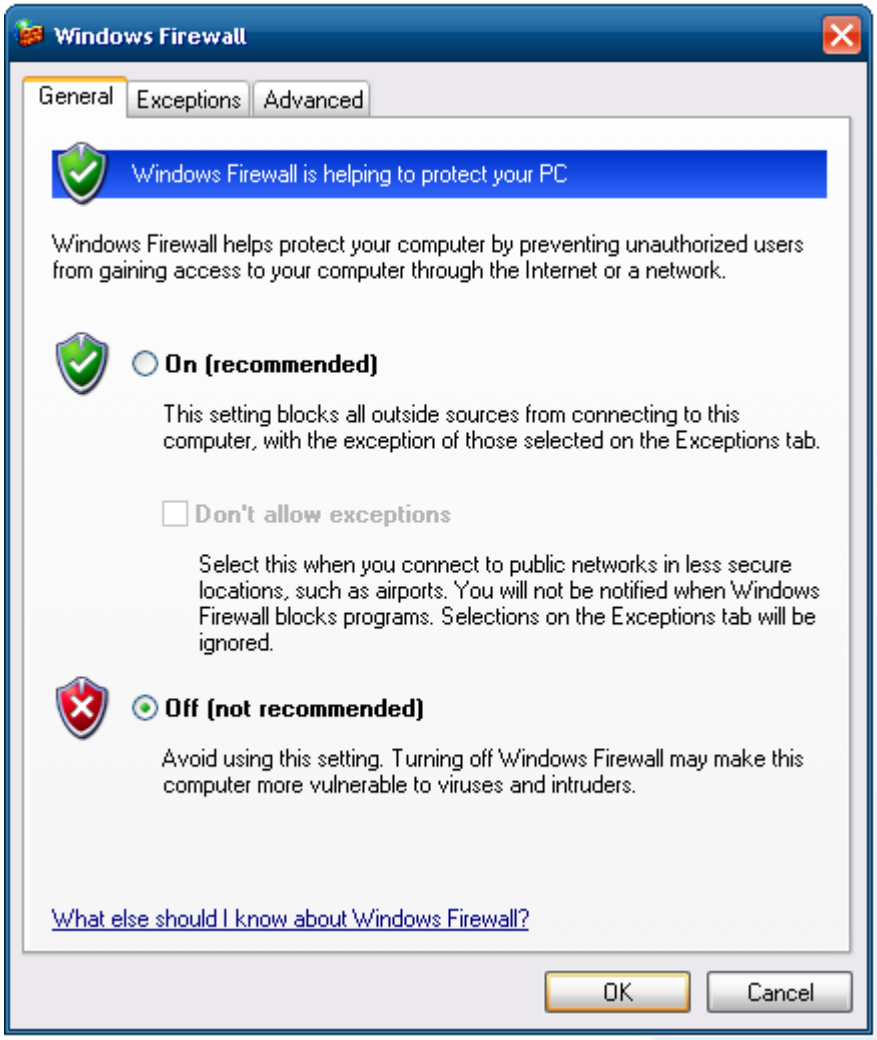
**To turn off the firewall**

In the **Windows Firewall** dialog box, click **Off (not recommended)**, and then click **OK**


Windows Firewall
General
Exceptions
Advanced
Windows Firewall is helping to protect your PC
Windows Firewall helps protect your computer by preventing unauthorized users from gaining access to your computer through the Internet or a network.
On (recommended)
This setting blocks all outside sources from connecting to this computer, with the exception of those selected on the Exceptions tab.
Don't allow exceptions
Select this when you connect to public networks in less secure locations, such as airports. You will not be notified when Windows Firewall blocks programs. Selections on the Exceptions tab will be ignored.
Off (not recommended)
Avoid using this setting. Turning off Windows Firewall may make this computer more vulnerable to viruses and intruders.
What else should I know about Windows Firewall?
OK
Cancel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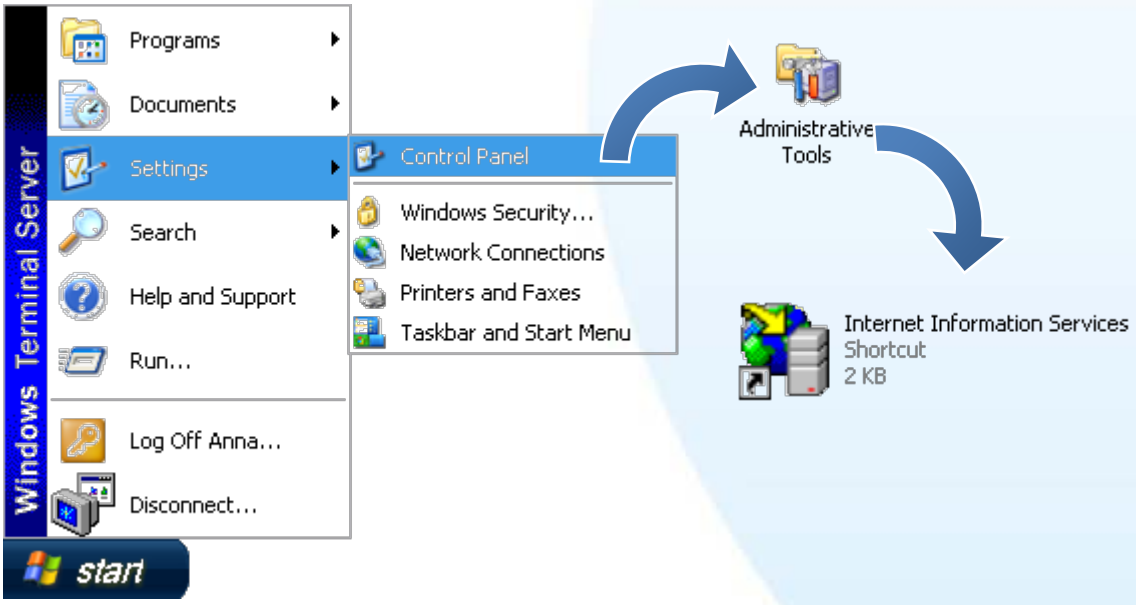
# 3.3. Configuring the FTP Server

Microsoft Internet Information Service (IIS) is installed in the XP-8000-Atom and enabled as default. The IIS includes FTP Server and Web Server. It is convenient to use anonymous FTP access as default. However, it may cause some security problems too.

**To configure the FTP Service**

1. Click **Start** menu, point to **Settings**, and then click **Control Panel**
2. Double-click the **Administrative Tools**, and then Double-click **Internet Information Services**





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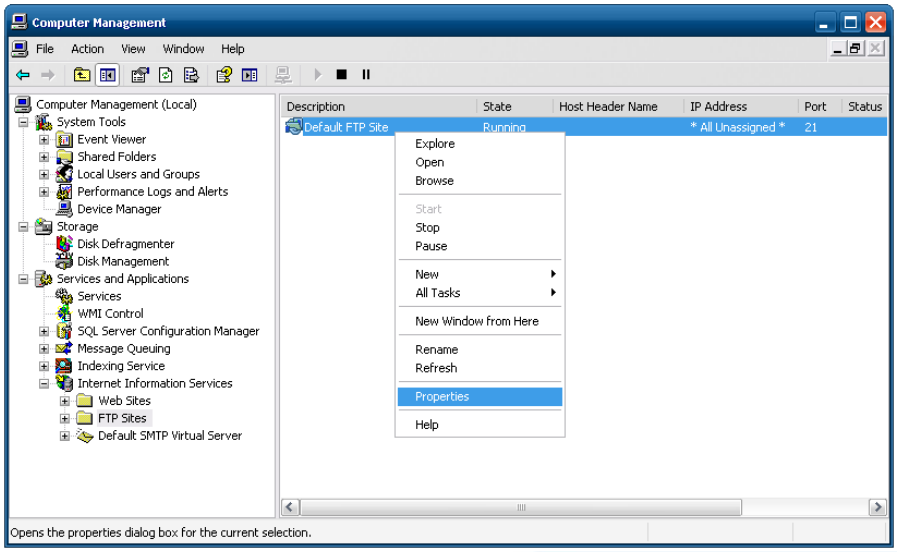
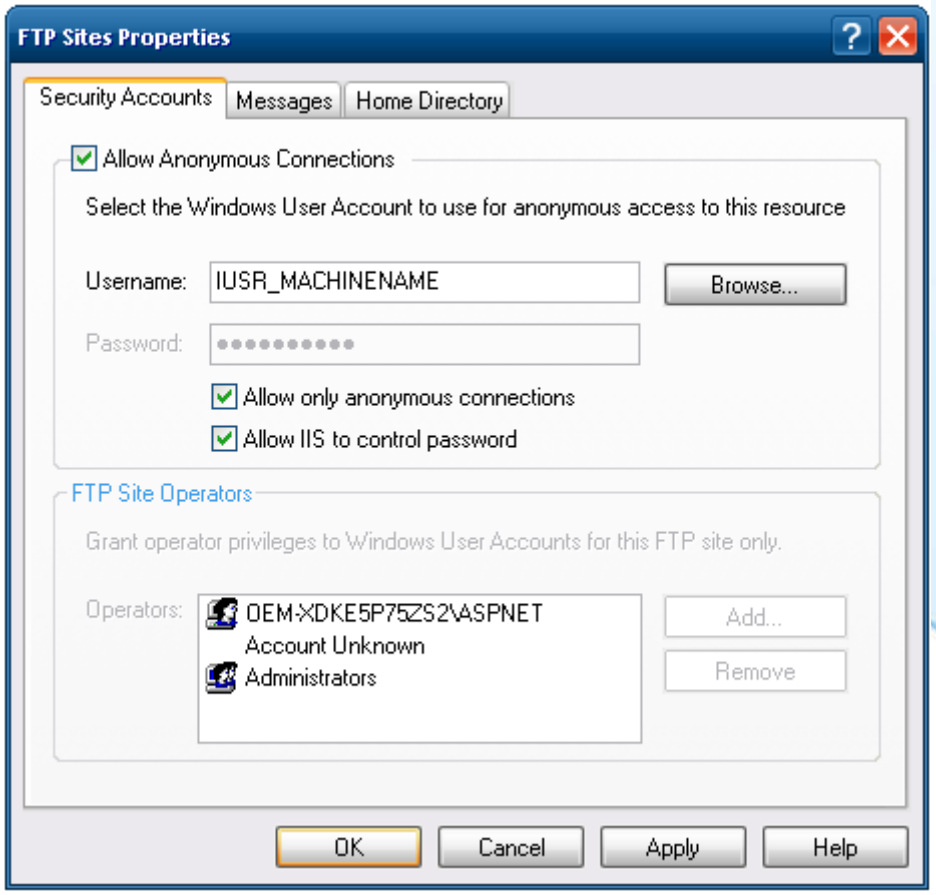
**3.** Expand the Server name, right-click **Default FTP Site**, and then click **Properties**




**4.** Click the **Security Accounts** tab, select **Allow Anonymous Connections**, and then select **Allow Only Anonymous Connections**





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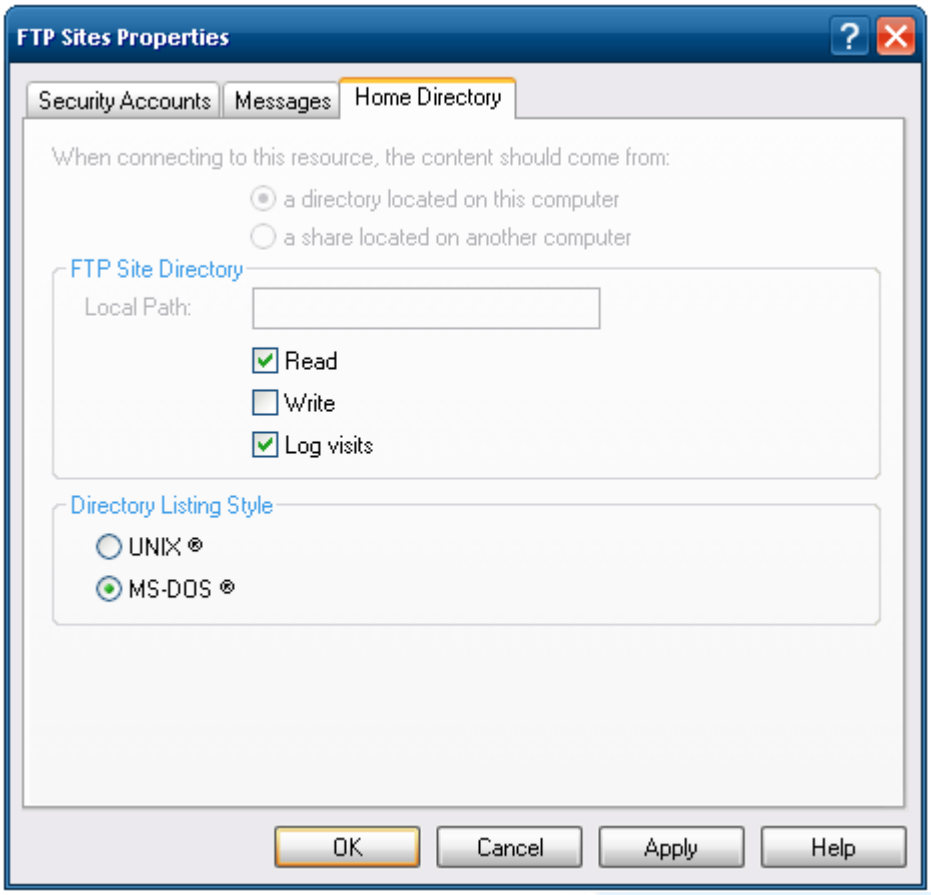
5. Click the Home Directory tab, and select Read and Log Visits, and clear Write
6. Click OK to save these settings.





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# 3.4. Enabling or Disabling EWF

EWF provides a means for protecting a volume from writes. All writes to an EWF-protected volume are redirected to an overlay. These writes are stored in the overlay and made available as part of the volume. In this way, it feels like that the volume is writeable. The overlay may exist either on disk or in RAM. If desired, the data stored in the overlay may be committed to the protected volume. The following figure is an overview of EWF.

For more detailed information about Enhanced Write Filter (EWF), please refer to

http://msdn.microsoft.com/en-us/library/ms912906(WinEmbedded.5).aspx

On XP8000-Atom, only the disk drive that OS resides (usually, c:\) can be protected.

In cases of maintenance, the disk must be updated to your desired changes. This contains three steps: (1) disabling EWF, (2) updating, and (3) re-enabling EWF.


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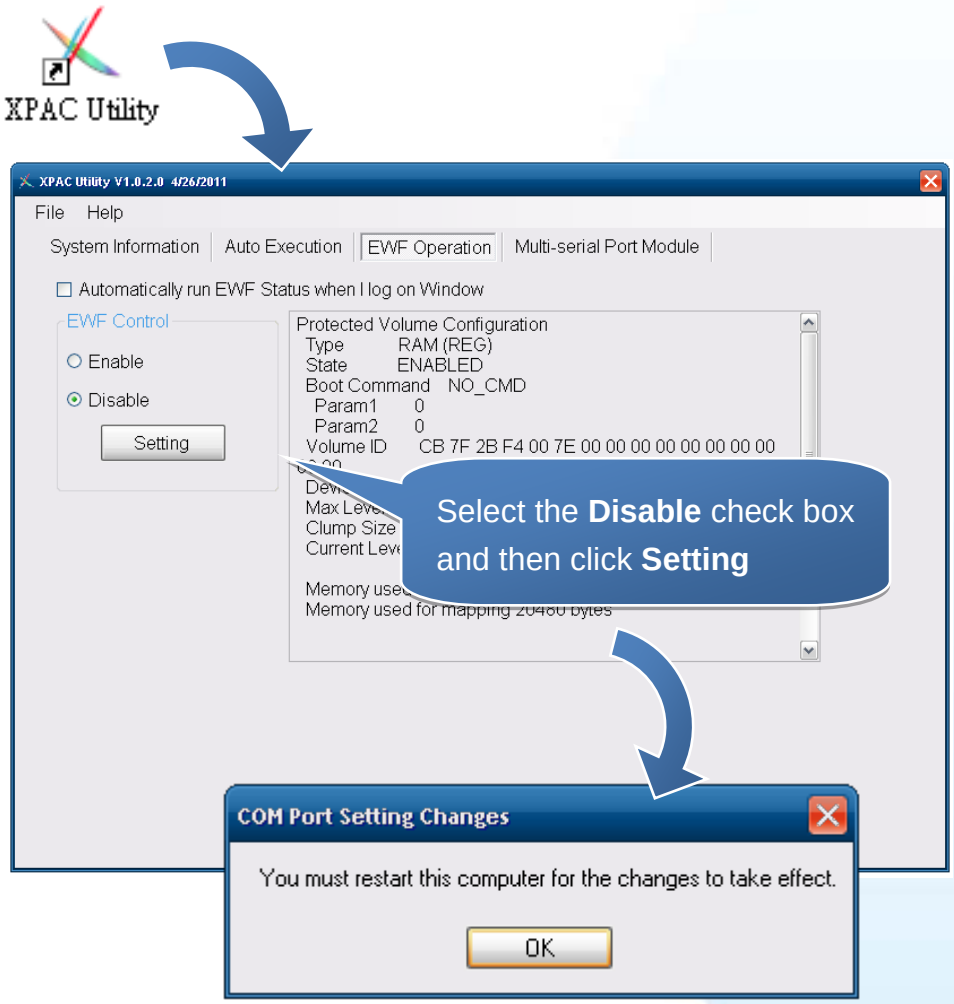
**To disable EWF**

1. Double-click the **XPAC Utility** shortcut on the desktop, and then click the **EWF operation** tab
2. Under **EWF Control**, select the **Disable** check box, and then click **Setting**
3. In the pop-up dialog box, click **OK**, and then reboot the XP-8000-Atom




## Tips & Warnings

If EWF is disabled and XP-8000-Atom suffers sudden power off, the operating system of XP-8000-Atom may be damaged.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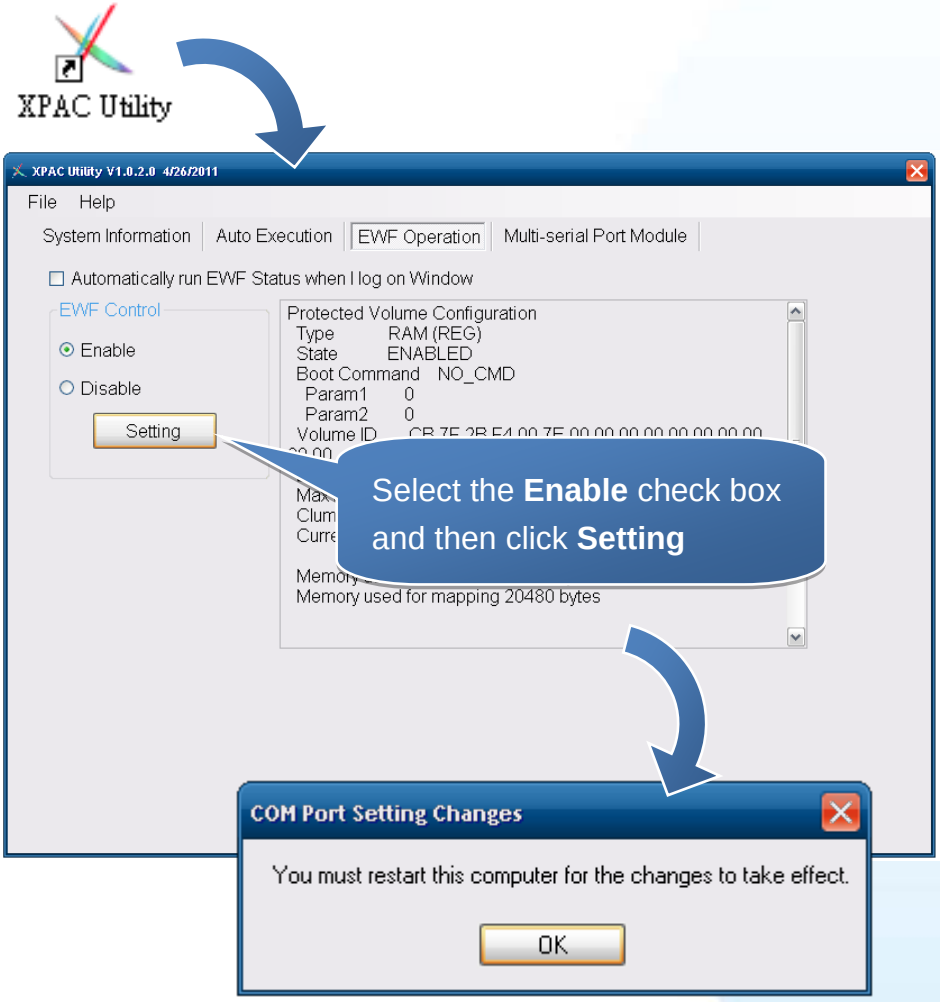
**To enable EWF**

1. Double-click the **XPAC Utility** shortcut on the desktop, and then click the **EWF operation** tab
2. Under **EWF Control**, select the **Enable** check box, and then click **Setting**
3. In the pop-up dialog box, click **OK**, and then reboot the XP-8000-Atom




## Tips & Warnings

Because EWF only takes effect on hard drive C (where the operating system resides), it is recommended to download your programs to Compact Flash or USB-HDD. It'll prevent operating system from damages of illegal writing or sudden power off.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**How to use EWF commands**

To control the status of EWF, use the EWF Manager Command “EWFMGR”.

- To see the status of EWF:

  ewfmgr c:

- To enable EWF:

  ewfmgr c: -enable (it is effective after rebooting.)

- To disable EWF:

  ewfmgr c: -commitanddisable –live

For more information about using EWF Manager Commands, see EWF Manager Commands

**Tips & Warnings**

Only the disk drive (usually, c:\) that OS resides can use the feature of EWF.



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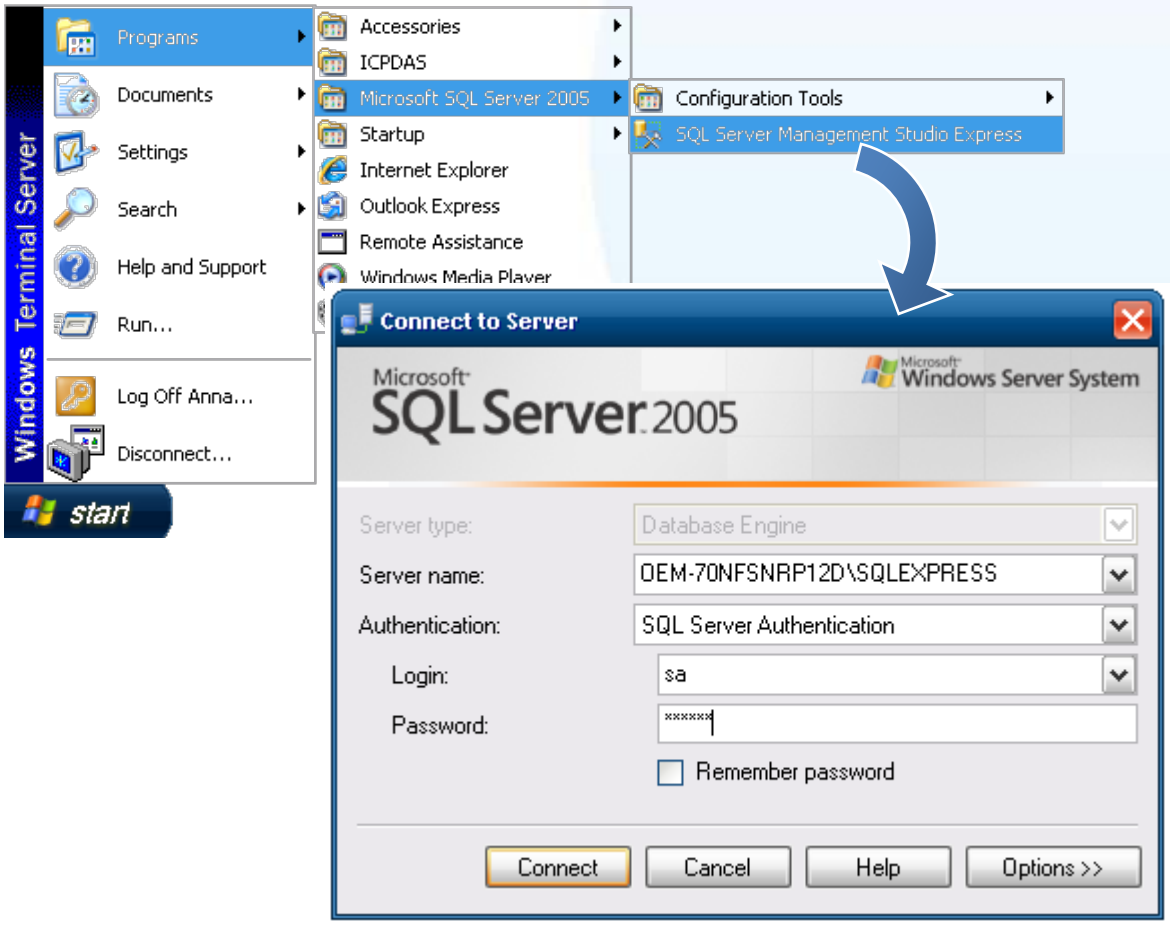
## 3.5. Creating a SQL Server Account

XP-8000-Atom has SQL Server 2005 Express Edition running as default. The default account and password are “sa” and “icpdas” respectively. To improve security of the SQL Server, it is necessary to change the account and the password.

**To start the SSMSE**

1. On the Start menu, point to Programs, point to Microsoft SQL Server 2005, and then click SQL Server Management Studio Express
2. Connect to Server. Default account is **sa**; default password is **icpdas**





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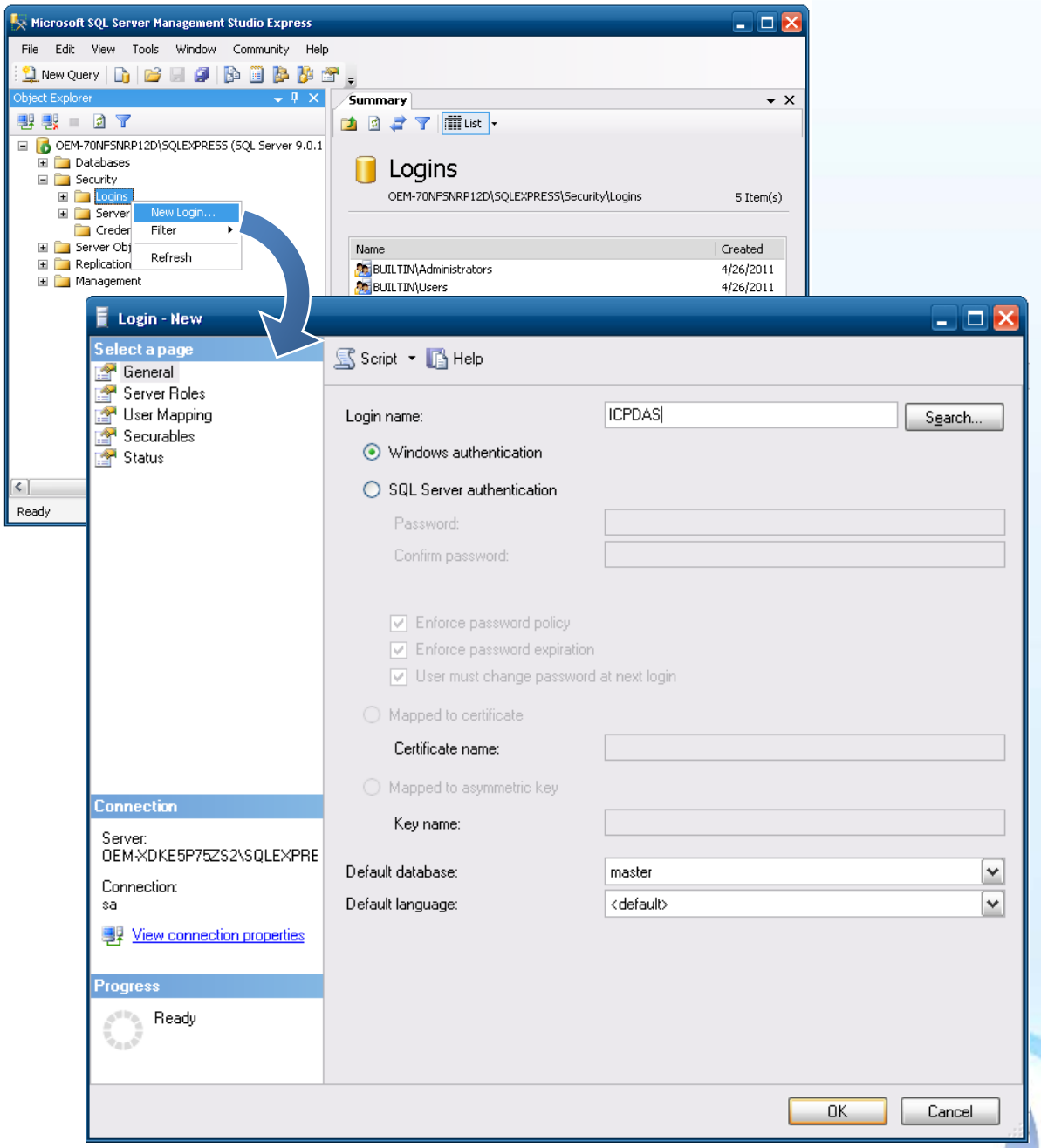
**To create a SQL Server login that uses Windows Authentication**

1. In SQL Server Management Studio Express, right-click the **Security** folder, and from the menu, select **New Login…**
2. On the **General** page, enter the name of a Windows user in the Login name box
3. Select Windows Authentication
4. Click OK





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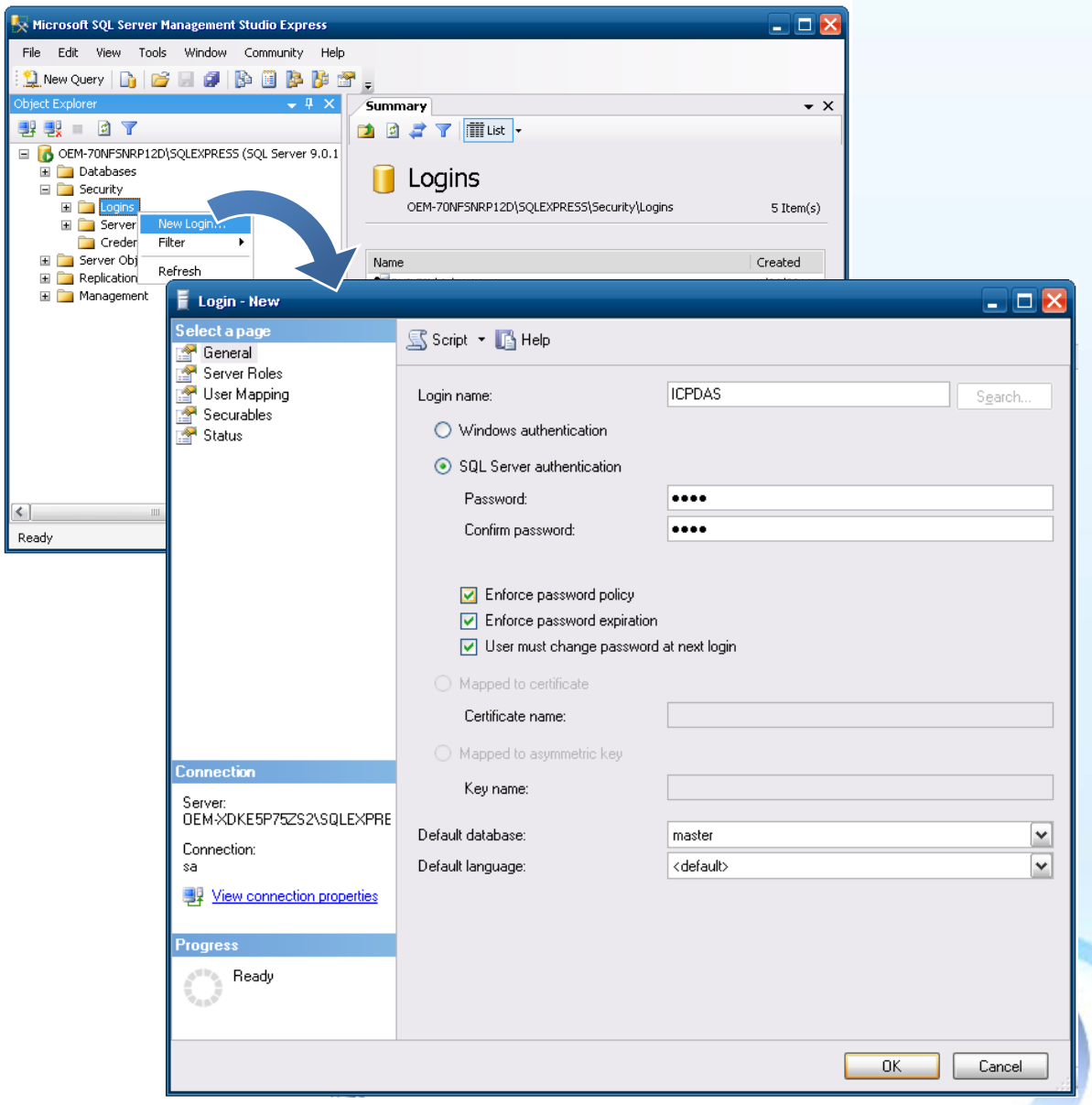
**To create a SQL Server login that uses SQL Server Authentication**

1. In SQL Server Management Studio Express, right-click the **Security** folder, and from the menu, select **New Login…**
2. On the **General** page, enter the name of a Windows user in the Login name box
3. Select **SQL Server Authentication**
4. Enter a password for the login
5. Select the password policy options that should be applied to the new login. In general, enforcing password policy is the more secure option
6. Click OK





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# 4. Tools and Tasks

This chapter provides information of the XP-8000-Atom tools and utilities that introduces the fundamental functions to manage the XP-8000-Atom easily.


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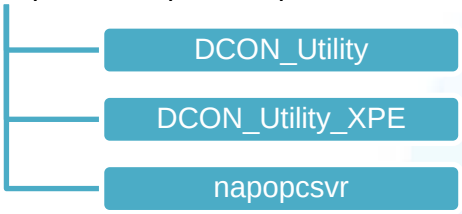
There are several tools and utilities built-in and designed for use with the XP-8000-Atom.

Both the tools and utilities can be found separately on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\XPAC-Atom\Tools\
ftp://ftp.icpdas.com/pub/cd/xpac-atom/tools/




In addition, there is a XPAC Utility that allows you to easily and quickly manage the XP-8000-Atom.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# 4.1. DCON_Utility

The DCON Utility is a client utility that runs on PC, and communicates with XP-8000-Atom via DCON protocol. The DCON Utility allows users to remotely connect to I-7K and I-87K series I/O modules for management through the COM port and Ethernet port.

For more information about using DCON_Utility, see
CD:\XPAC-Atom\Tools\DCON_Utility\Manual\
ftp://ftp.icpdas.com/pub/cd/xpac-atom/tools/dcon_utility/manual/


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# 4.2. DCON_XPE

The DCON_XPE is a toolkit that help user to search the network, easily to configure and test the I/O modules via the serial port (RS-232/485) or Ethernet port (using virtual com port). It also helps to configure the i-87K I/O modules on WinCon 8000 system.


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# 4.3. NAPOPCSVR

The NAPOPC_XPE DA Server is one set of ICP DAS OPC solution. It works on XP-8000-Atom (Based on Windows XP Embedded Operation System) and uses an Explorer-style user interface to display a hierarchical tree of modules and groups with their associated tags. A group can be defined as a subdirectory containing one or more tags. A module may have many subgroups of tags and all tags belong to their module. (The "OPC" stands for "OLE for Process Control" and the "DA" stands for "Data Access").

Furthermore, NAPOPC_XPE DA Server package provides not only traditional “OPC” interface but also two “Modbus Slave” interfaces to communicate with modbus device. The two interfaces play the role of bridge between OPC client and modbus slave to transform the OPC tags to modbus address. Users can accept its result of auto-mapping or adjust the modbus address by themselves.

For more information about using NAPOPCSVR, see
CD:\XPAC-Atom\Tools\napopcsvr\
ftp://ftp.icpdas.com/pub/cd/xpac-atom/tools/napopcsvr/


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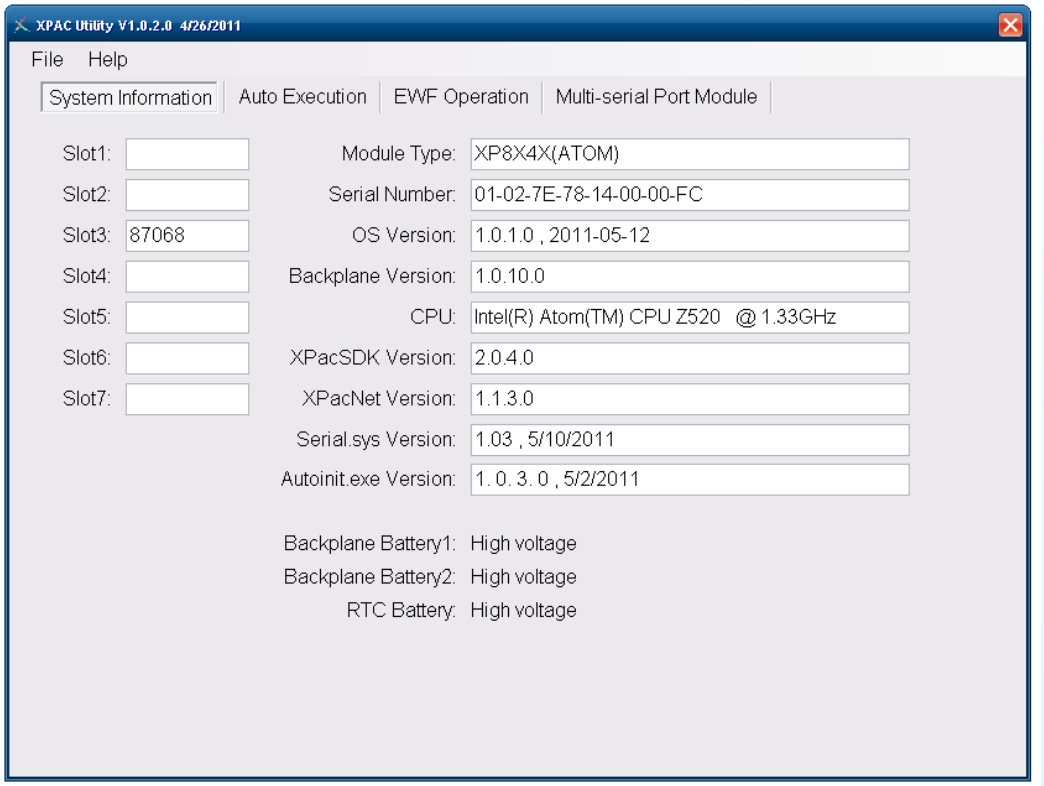
# 4.4. XPAC_Utility

XPAC Utility is a collection of software applications that enable management and configuration of XP-8000-Atom system and features.




The XPAC Utility includes the following property tabs, all property tabs will be explained later.

- System Information
- Auto Execution
- EWF Operation
- Multi-serial Port Module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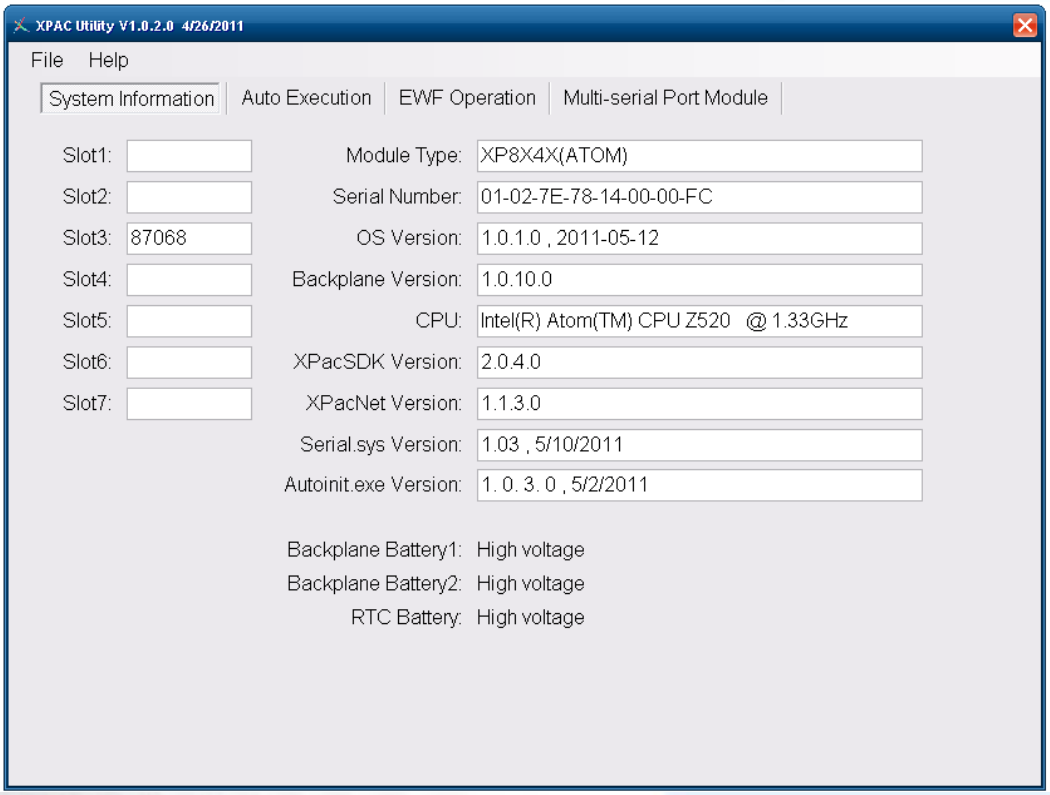
# 4.4.1. System Information

The System Information tab provides functions to monitor necessary device information of the XP-8000-Atom. The system information is the most important note of version control for upgrading system.





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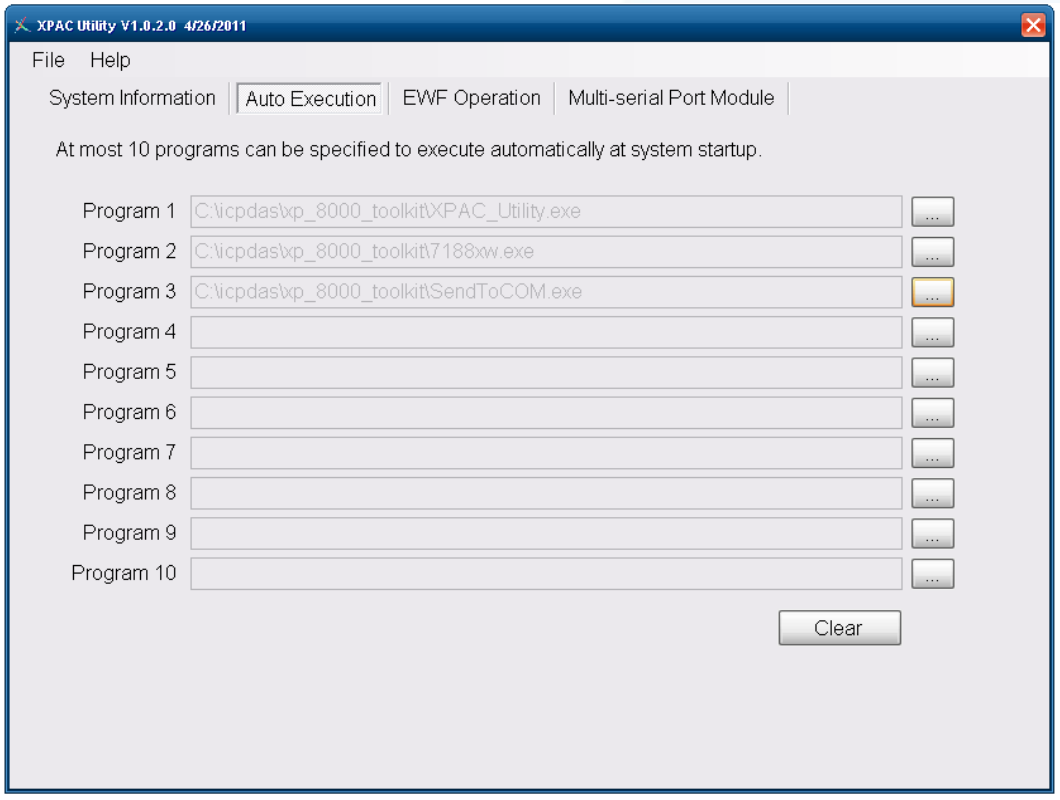
# 4.4.2. Auto Execution

The Auto Execution tab provides functions to configure programs running at XP-8000-Atom startup, it allows users to configure ten execute files at most.

### Tips & Warnings

The allowed file types are .exe and .bat, and they are executed in order of program 1, program 2, etc.




| The tab use to | How to use |
|---|---|
| Configure programs running at startup | Press the Browse button to select the execute file which you want, and then press the Apply button. |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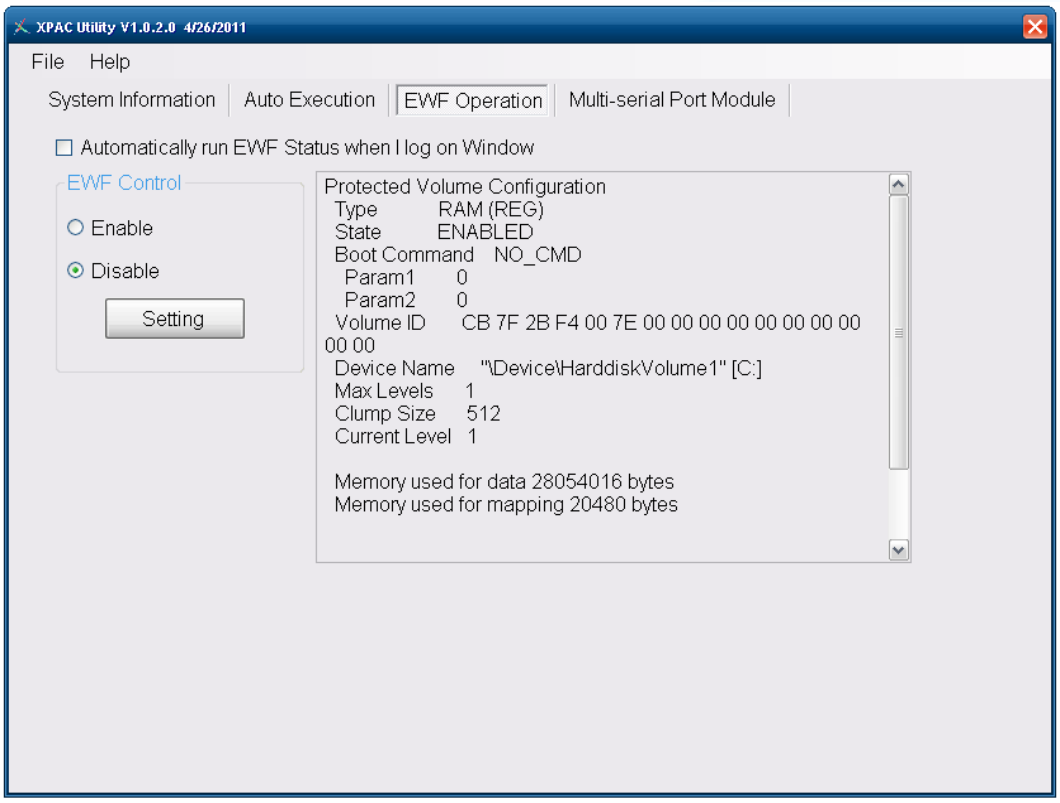
# 4.4.3. EWF Operation

The EWF is a safety mechanism on XP-8000-Atom for protecting the system from virus infection and harsh environments. Before installing application or modifying system settings, EWF needs to be disabled; after the operation completed, EWF needs to be enabled. When EWF is enabled, the modification on C disk will be invalid at the next reboot.




| The tab use to | How to use |
|---|---|
| Enable/disable the EWF control | Enable: Select the Enable option<br>Disable: Select the Disable option. |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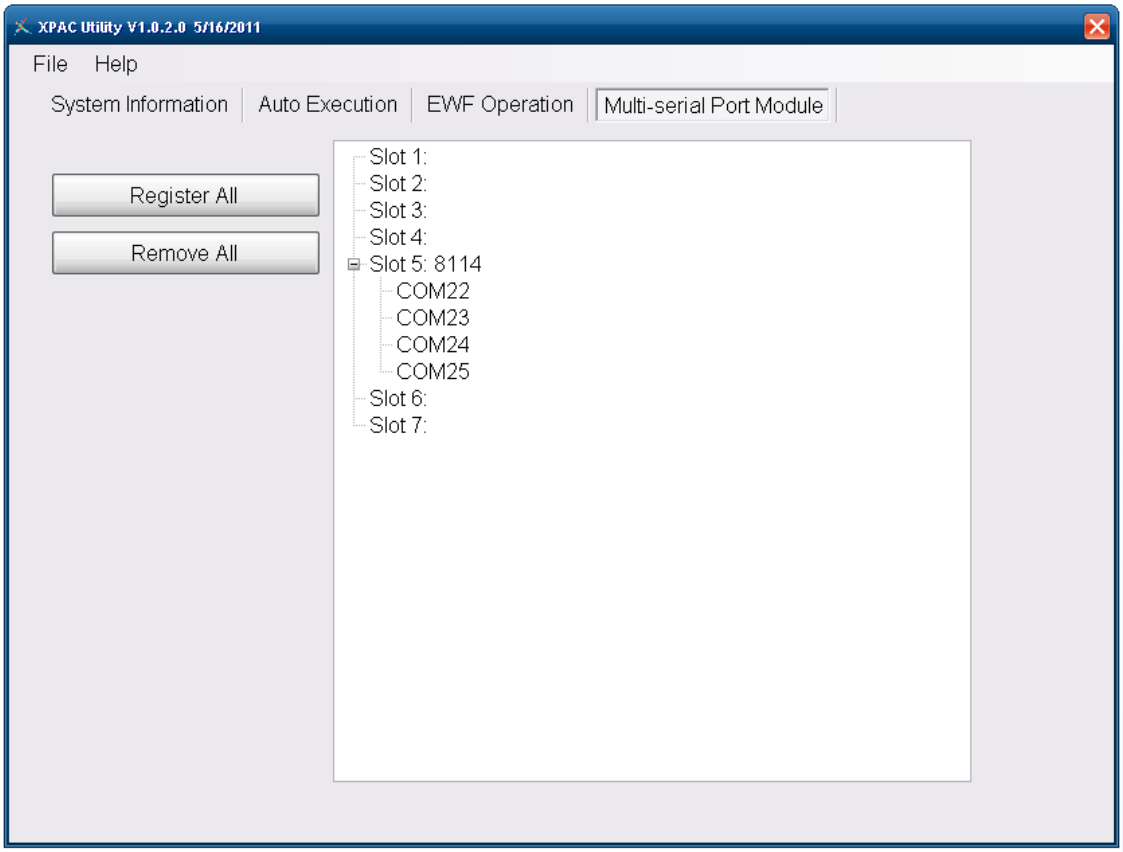
# 4.4.4. Multi-serial Port Module

The Multi-serial Port Module tab provides function to check the driver of multi-IO modules, such as 8114, 8144, 8142, and 8112.




| The tab use to | How to use |
|---|---|
| Install/Uninstall the multi-serial port driver | Install the multi-serial port driver:<br>Click Register All button<br>Uninstall the multi-serial port driver:<br>Click Remove All button |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# 5. Your First XP-8000-Atom Program

This chapter provides a guided tour that describes the steps needed to set-up a development environment, download, install, configure for user programming with the XP-8000-Atom.


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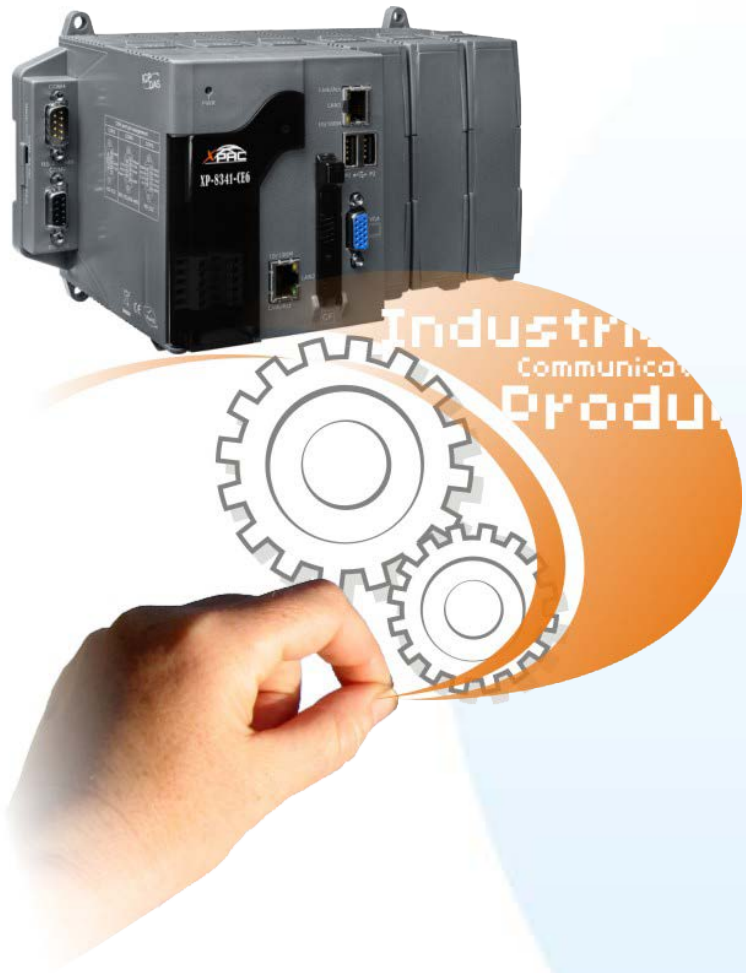
Before writing your first program, ensure that you have the necessary development tool and the corresponding XP-8000-Atom SDKs are installed on your system.

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# 5.1. Selecting a Development Tools

XP-8000-Atom is a Windows Embedded Standard-based unit. Windows Embedded Standard is a mature embedded operating system which supports rapid development. A standard development tool is list as follows which are highly integrated, with comprehensive support for developing applications of Windows Embedded Standard-based XP-8000-Atom.

## ➢ Visual Studio

**Visual Studio**

XP-8000-Atom has .NET Compact Framework 3.5 installed. Visual Studio takes full advantage of the .NET Compact Framework, which uses public Internet standards to enable integration with new and existing applications running on any platform. Supported languages include Visual C#, Visual C++ and Visual Basic .NET.


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## 5.2. Installing the XP-8000-Atom SDKs

The XPAC SDK is a Software Development Kit (SDK) that contains C header files, C libraries and documents.

**1.** Get the XP-8000-Atom SDK

The XP-8000-Atom SDK can be installed from the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

**Platform SDK:**

CD:\XPAC-Atom\SDK\Install\

ftp://ftp.icpdas.com/pub/cd/xpac-atom/sdk/install/

**2.** Install the XP-8000-Atom SDK


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## 5.3. Creating Your First XP-8000-Atom Program

The best way to learn programming with XP-8000-Atom is to actually create a XP-8000-Atom program.

Here we will guide you through creating this simple program in both VB.net, C# and C++.


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### 5.3.1. Your First XP-8000-Atom Program with the VB.net

Here we will demonstrate how to create a VB.net program running on XP-8000-Atom with the VB.net development tool

1. Create a new project
2. Specify the path of the XPAC reference
3. Add the control to the form
4. Add the event handling for the control
5. Upload the application to XP-8000-Atom
6. Execute the application on XP-8000-Atom

In this tutorial, we will assume that you have installed XPAC platform SDK on PC and used the Visual Studio 2008 for application development.


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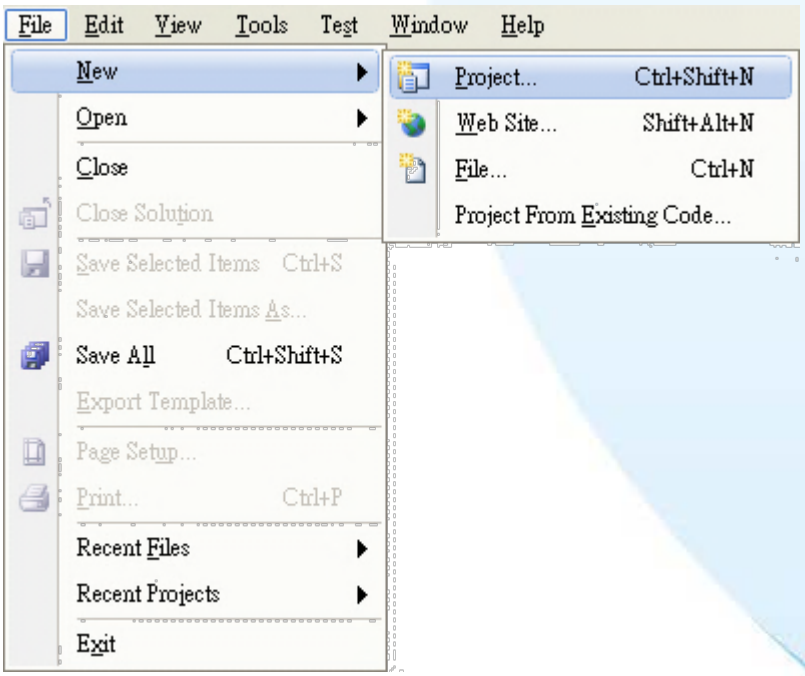
# 5.3.1.1. Creating a New Project

The Visual VB.net project template is a composite control that you use in this example creates a new project with this user control.

**1.** Start Visual Studio 2008

**Visual Studio 2008**

**2.** On the File menu, point to New, and then click Project





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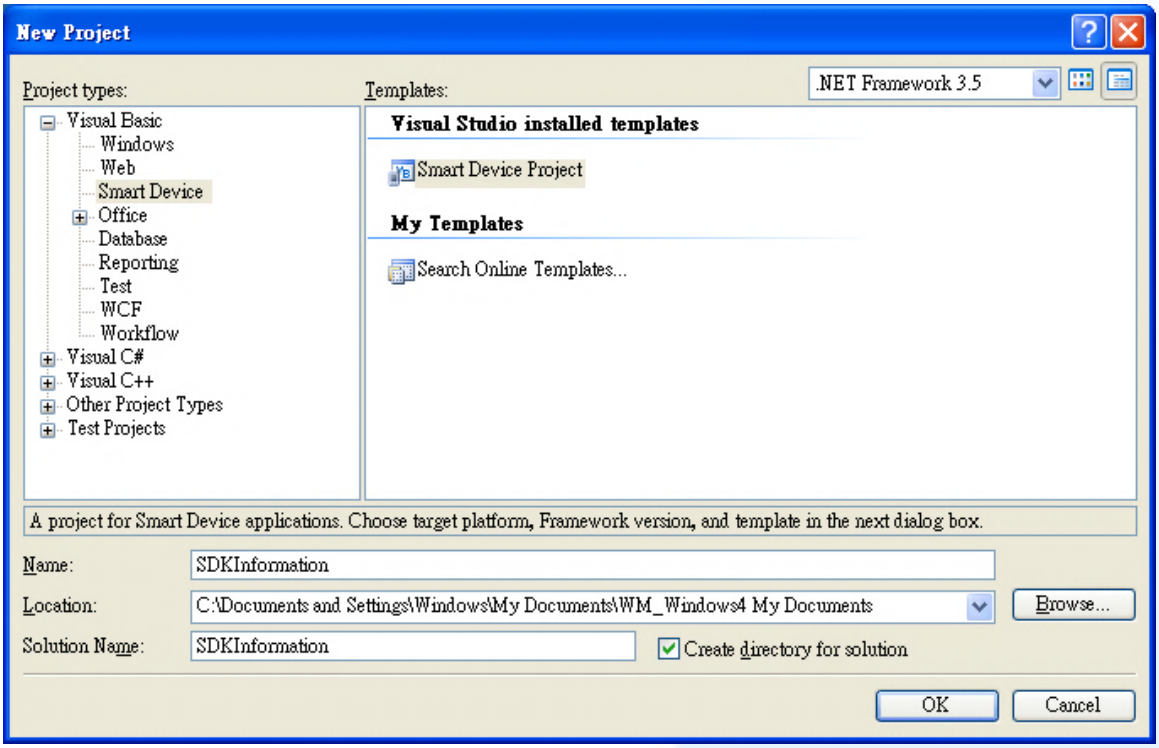
3. In the Project types pane, expand Visual Basic, and then click Smart Device
4. In the Templates pane, click Smart Device
5. Type a name in the Name field, and then click OK

   Here we will enter the name “SDKInformation” and a different location for the project if you wish





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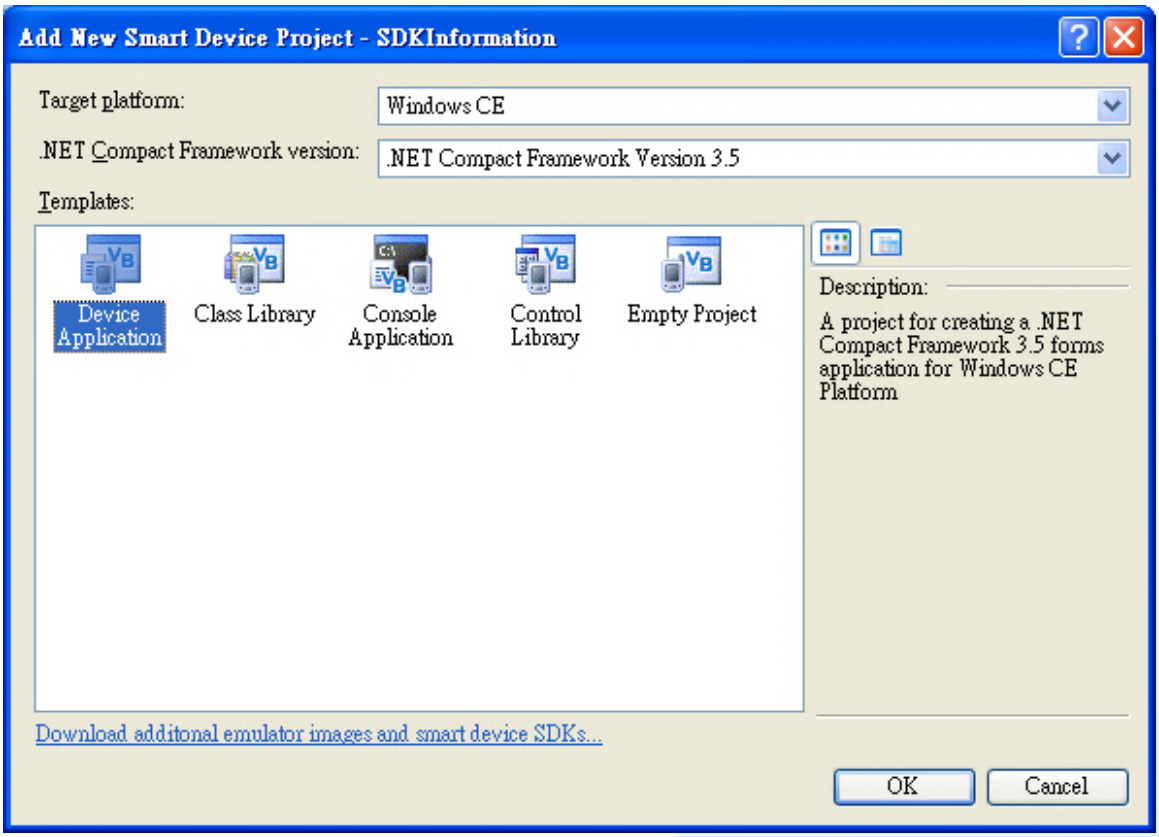
6. In the Target platform item, choose Windows CE
7. in the .NET Compact Formwork version item, choose .NET Compact Framework Version 3.5
8. in the Templates pane, choose Device Application, and then click Next





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## 5.3.1.2. Specifying the Path of the XPAC Reference

The XPAC SDK provides a complete solution to integrate with XPAC and it's compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

**1.** Get the XPacNET.dll and copy it to the project folder

The XPacNET.dll can be obtained from the link below that has been provided on the CD or by downloading the latest version from ICP DAS web site.

CD:\XPAC-Atom\SDK\XPacSDK\XPacNET\
ftp://ftp.icpdas.com/pub/cd/xpac-atom/sdk/xpacsdk/xpacnet/

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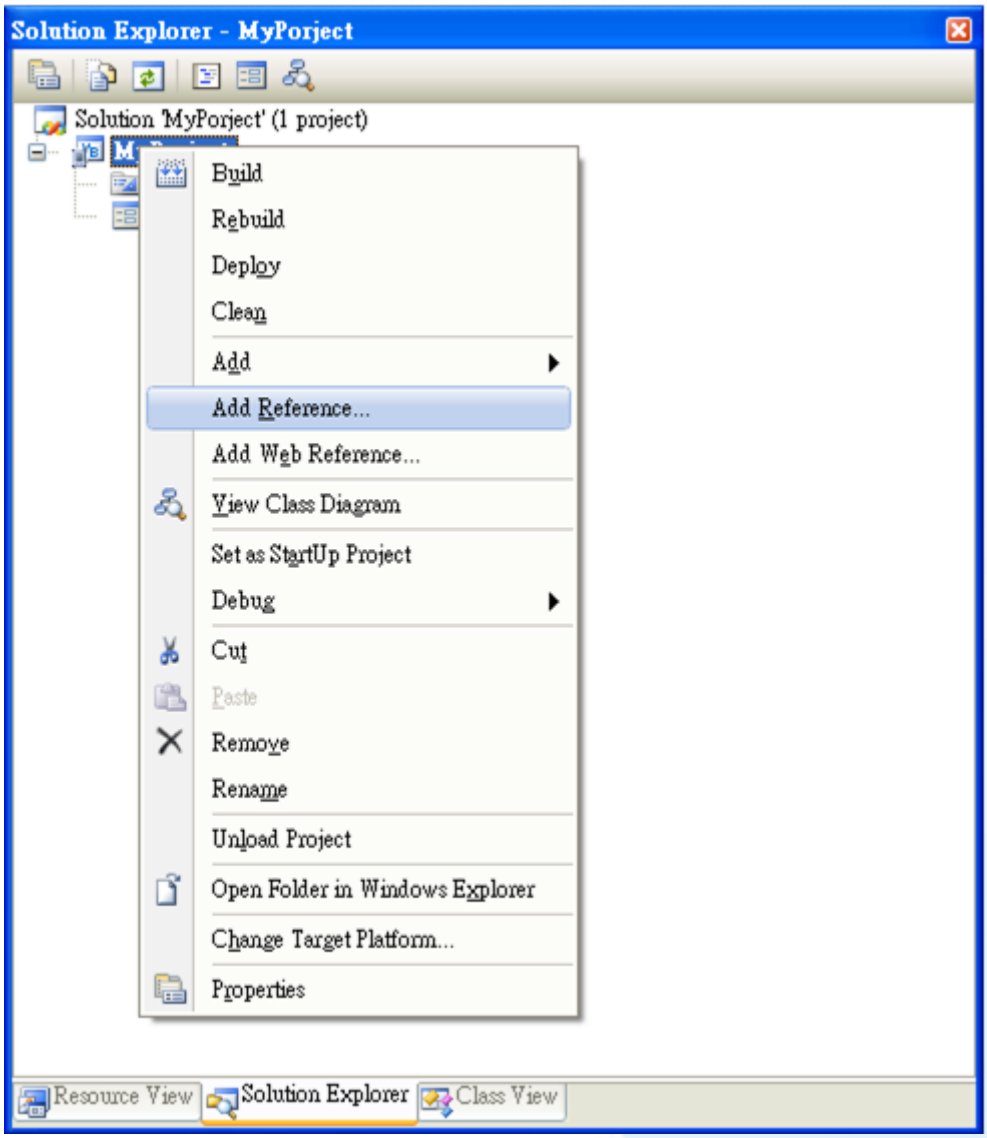
**2.** In Solution Explorer, right-click the References node, and then click Add Reference…





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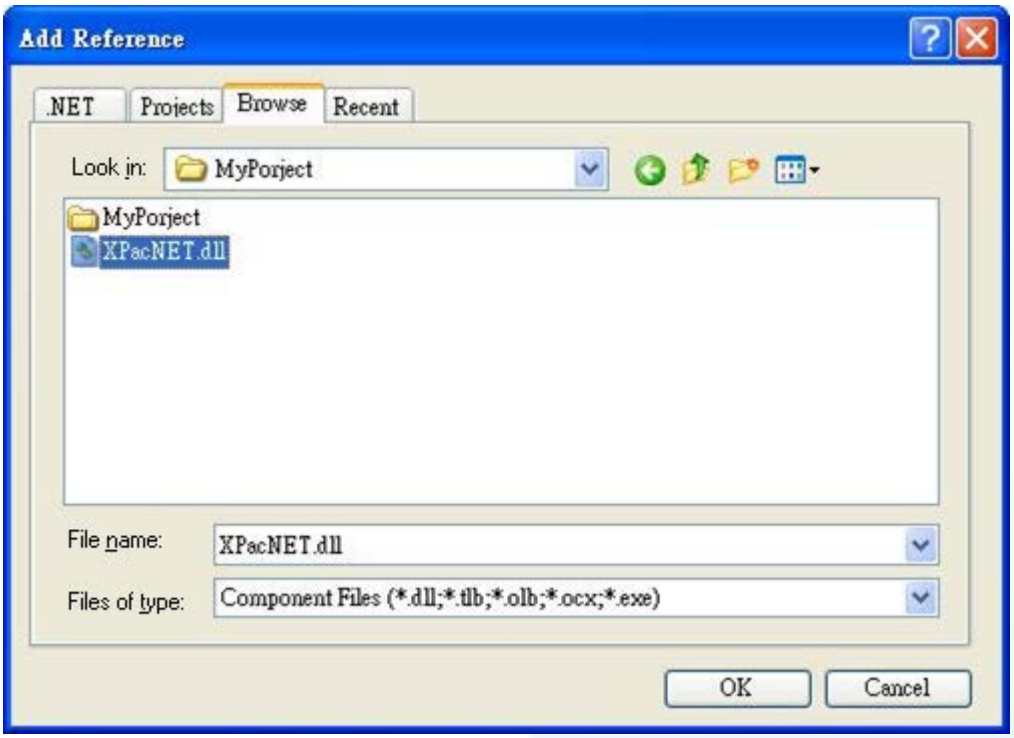
**3.** Select “Browse” tab and add the XPacNET.dll





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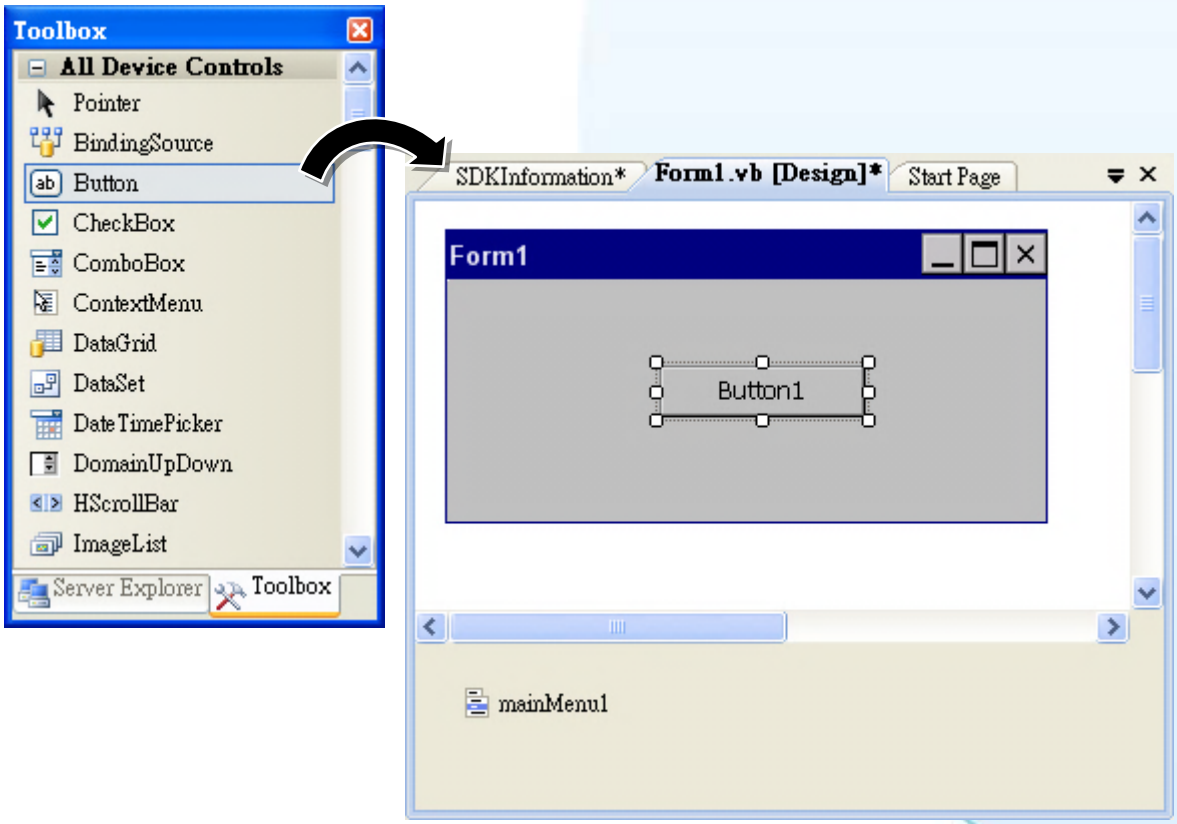
## 5.3.1.3. Adding the Control to the Form

You can drag various controls from the Toolbox onto the form. These controls are not really "live"; they are just images that are convenient to move around on the form into a precise location.

After you add a control to your form, you can use the Properties window to set its properties, such as background color and default text. The values that you specify in the Properties window are the initial values that will be assigned to that property when the control is created at run time.

**1.** From the Toolbox, drag a Button control onto the form





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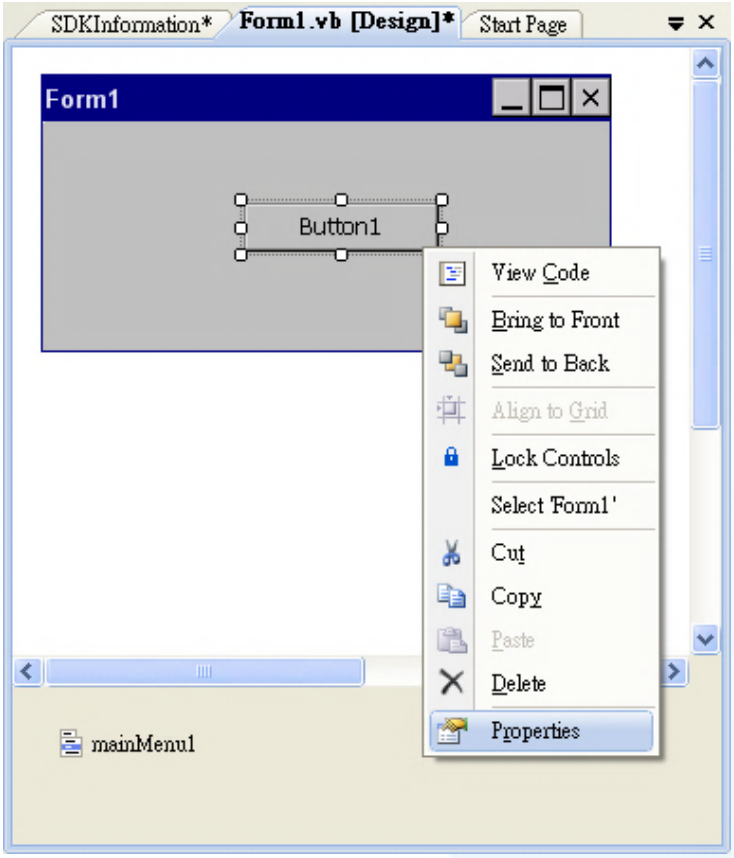
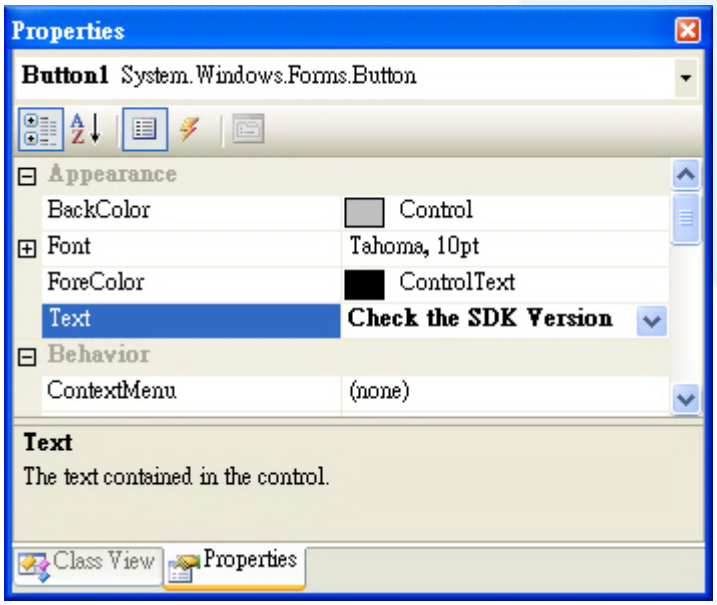
**2.** Right-click the Button control, and then click Properties




**3.** In the Properties window, type Check the SDK version, and press ENTER to set the Text property





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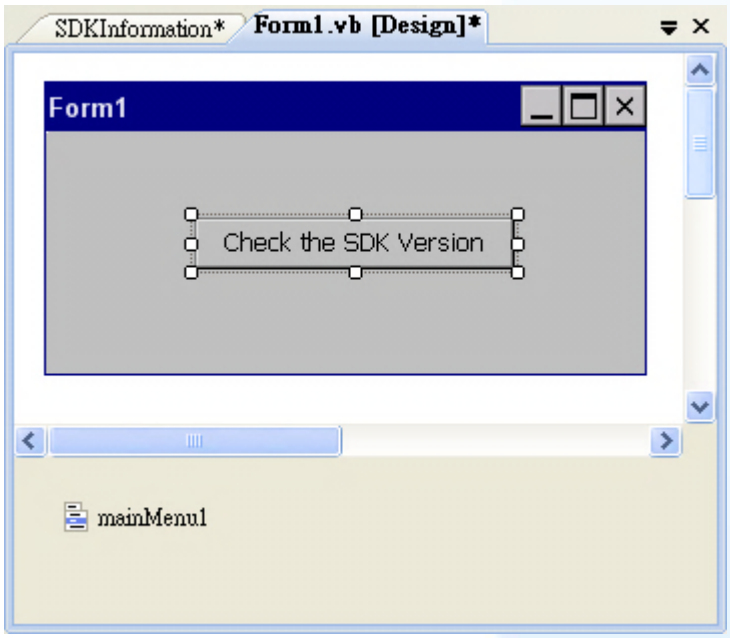
## 5.3.1.4. Adding the Event Handling to the Control

You have finished the design stage of your application and are at the point when you can start adding some code to provide the program's functionality.

**1.** Double-click the button on the form





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**2.** Inserting the following code

MessageBox.Show(XPacNET.XPac.pac_GetXPacSDKVersion())

```
Public Class Form1

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
        MessageBox.Show(XPacNET.XPac.pac_GetXPacSDKVersion())
    End Sub
End Class
```

### Tips & Warnings

The “XPacNET” of “unsing XPacNET” is case- sensitive.



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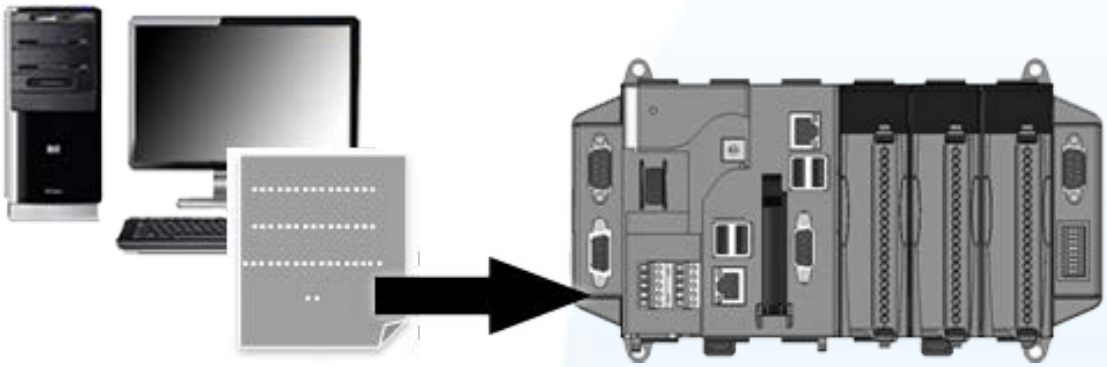
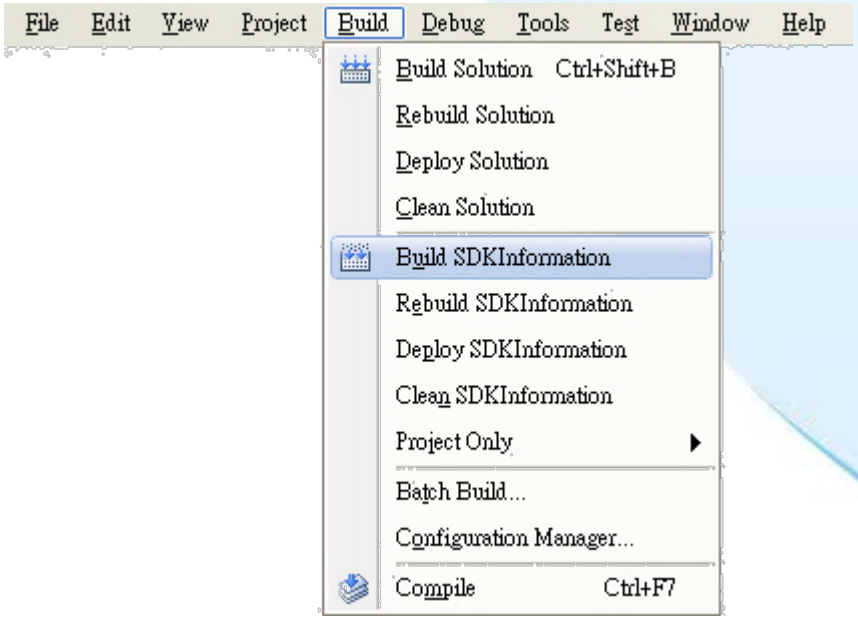
## 5.3.1.5. Uploading the Application to XP-8000-Atom

XP-8000-Atom provide FTP server service, you can upload files to XP-8000-Atom or download files from a public FTP server.



**1.** On the Build menu, click Build SDKInformation





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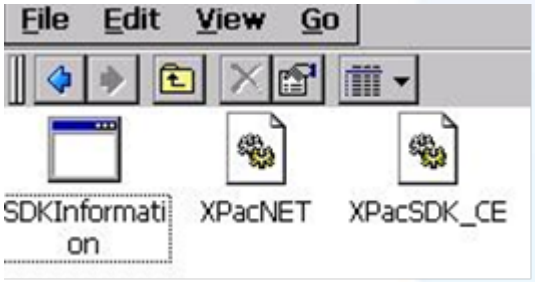
2. Open the browser and type the IP address of XP-8000-Atom

3. Upload the SDKInformation.exe application and the corresponding XPacSDK_CE.dll and XPacNET.dll files to the XPAC

### Tips & Warnings

For applications programming in C# and VB.net with .net compact framework, when executing these application on the XP-8000-Atom, the corresponding XPacSDK_CE.dll and XPacNET.dll must be in the same directory as the .exe file.





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### 5.3.1.6. Executing the Application on XP-8000-Atom

After uploading the application to XP-8000-Atom, you can just double-click it on XP-8000-Atom to execute it.


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### 5.3.2. Your First XP-8000-Atom Program with the Visual C#

Here we will demonstrate how to create a Visual C# program running on XP-8000-Atom with the Visual C# development tool

1. Create a new project
2. Specify the path of the XPAC reference
3. Add the control to the form
4. Add the event handling for the control
5. Upload the application to XP-8000-Atom
6. Execute the application on XP-8000-Atom

In this tutorial, we will assume that you have installed XPAC platform SDK on PC and used the Visual Studio 2008 for application development.


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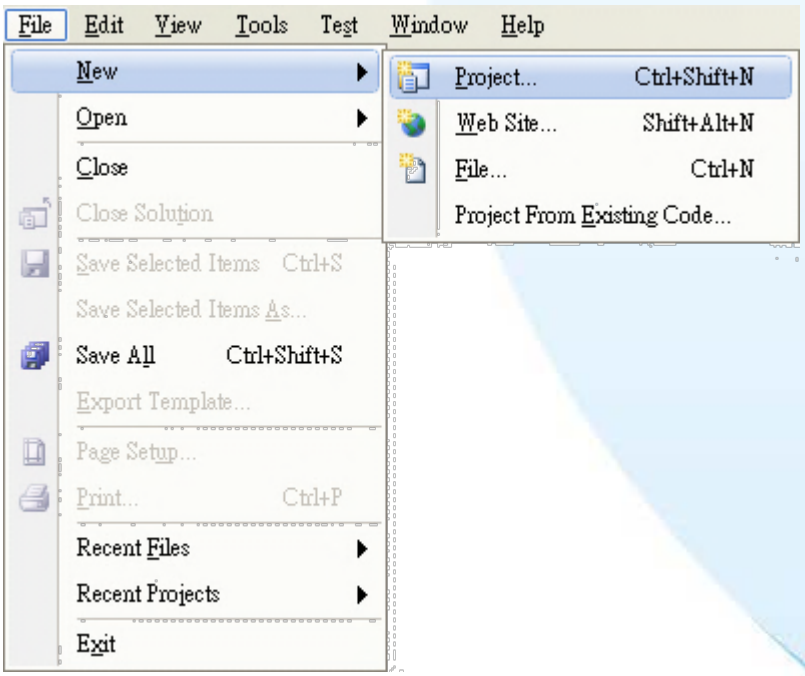
# 5.3.2.1. Creating a New Project

The Visual C# project template is a composite control that you use in this example creates a new project with this user control.

**1.** Start Visual Studio 2008

**Visual Studio 2008**

**2.** On the File menu, point to New, and then click Project





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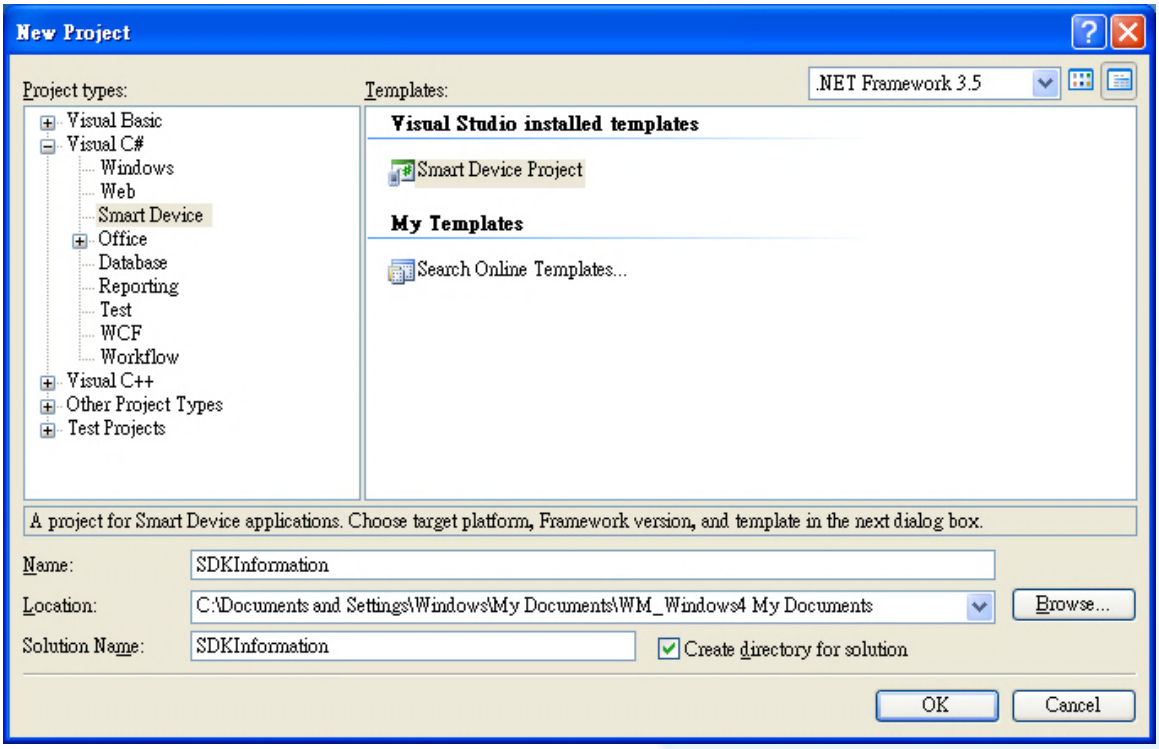
3. In the Project types pane, expand Visual C#, and then click Smart Device
4. In the Templates pane, click Smart Device
5. Type a name in the Name field, and then click OK

   Here we will enter the name “SDKInformation” and a different location for the project if you wish





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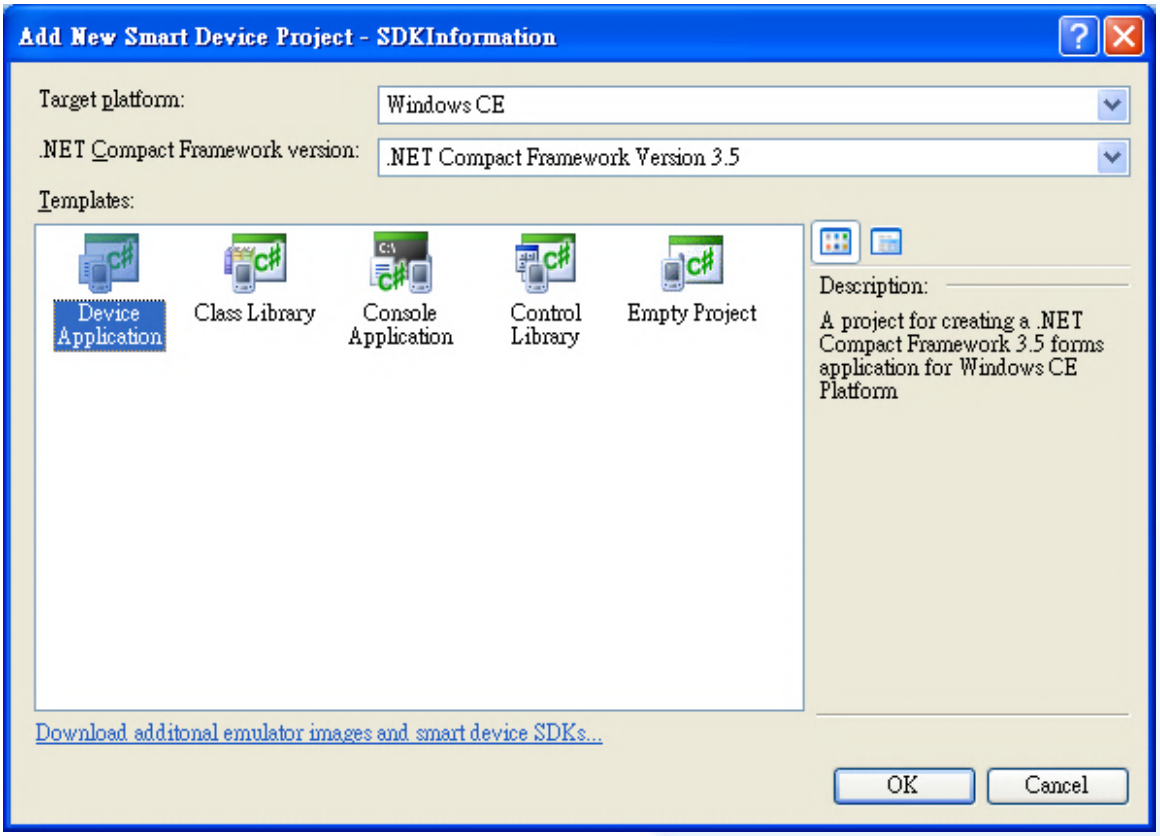
6. In the Target platform item, choose Windows CE
7. in the .NET Compact Formwork version item, choose .NET Compact Framework Version 3.5
8. in the Templates pane, choose Device Application, and then click Next





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## 5.3.2.2. Specifying the Path of the XPAC Reference

The XPAC SDKs provides a complete solution to integrate with XPAC and it's compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

**1.** Get the XPacNET.dll and copy it to the project folder

The XPacNET.dll can be obtained from the link below that has been provided on the CD or by downloading the latest version from ICP DAS web site.

CD:\XPAC-Atom\SDK\XPacSDK\XPacNET\
ftp://ftp.icpdas.com/pub/cd/xpac-atom/sdk/xpacsdk/xpacnet/

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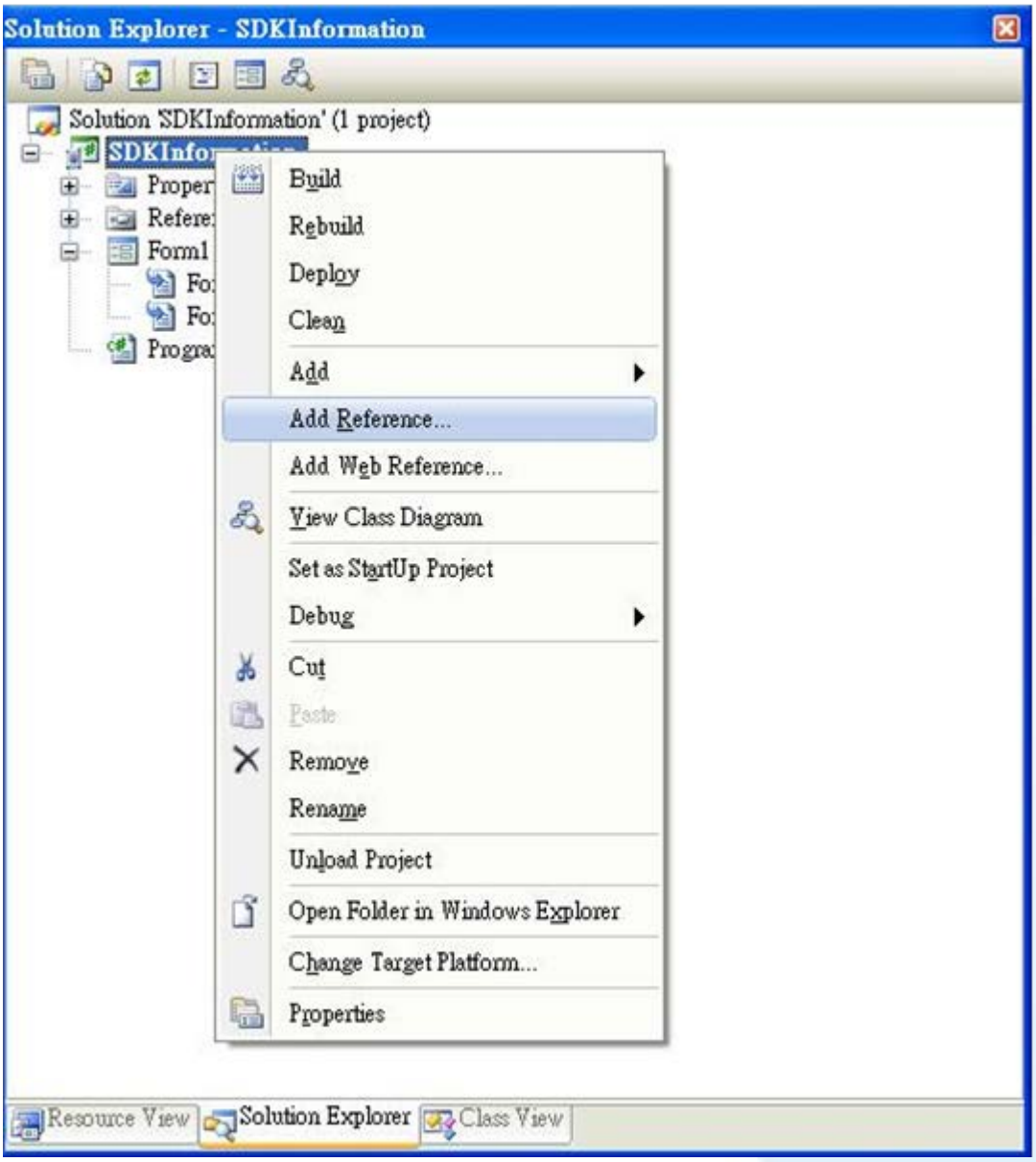
**2.** In Solution Explorer, right-click the References node and then click Add Reference…





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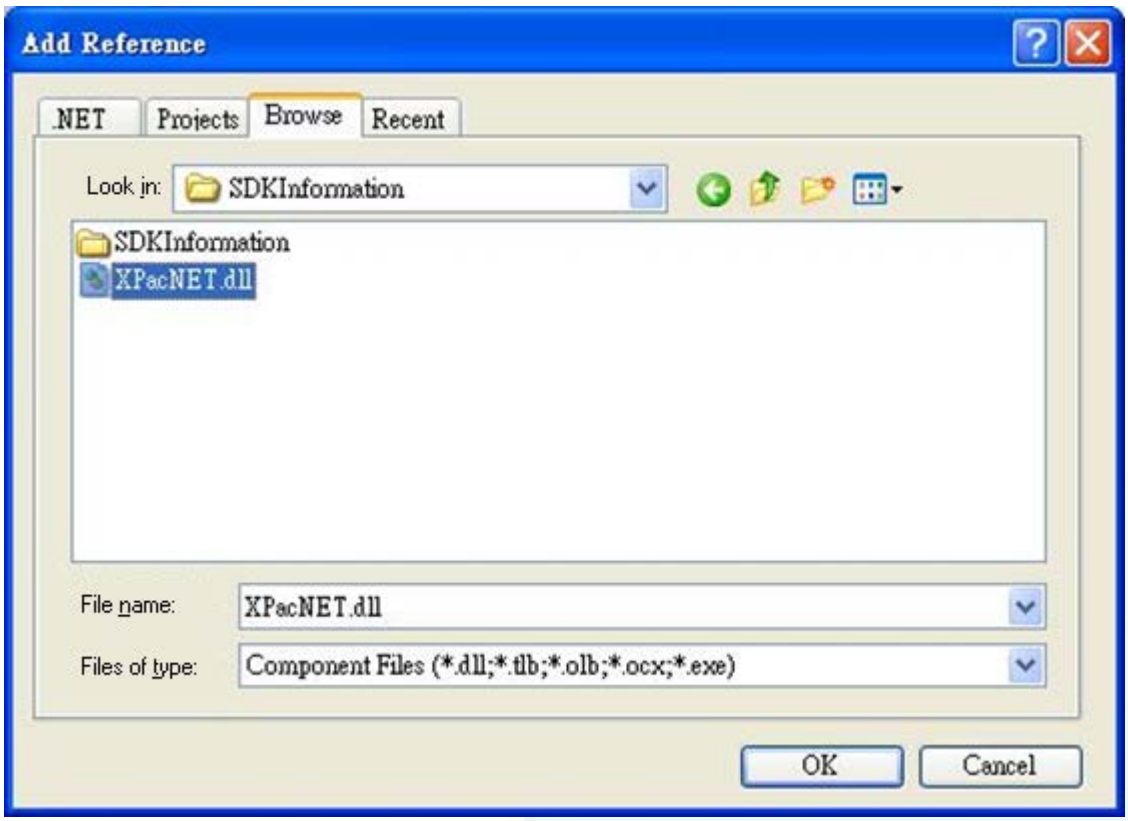
**3.** Select “Browse” tab and add the XPacNET.dll





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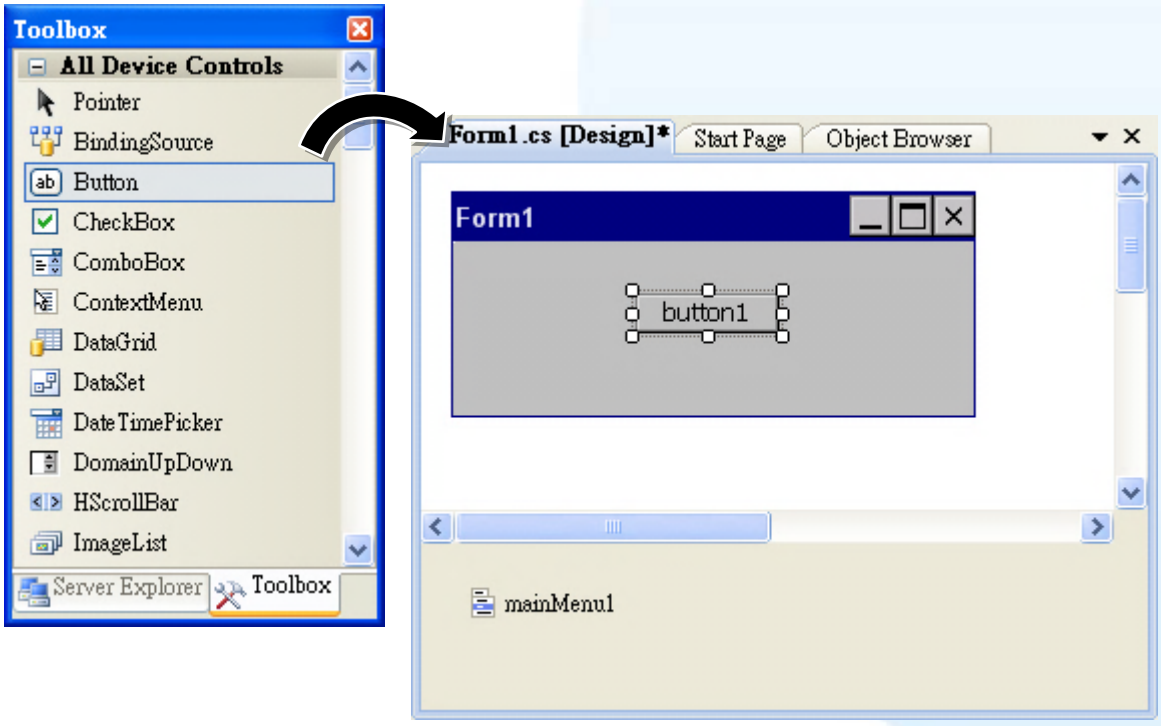
## 5.3.2.3. Adding the Control to the Form

You can drag various controls from the Toolbox onto the form. These controls are not really "live"; they are just images that are convenient to move around on the form into a precise location.

After you add a control to your form, you can use the Properties window to set its properties, such as background color and default text. The values that you specify in the Properties window are the initial values that will be assigned to that property when the control is created at run time.

**1.** From the Toolbox, drag a Button control onto the form





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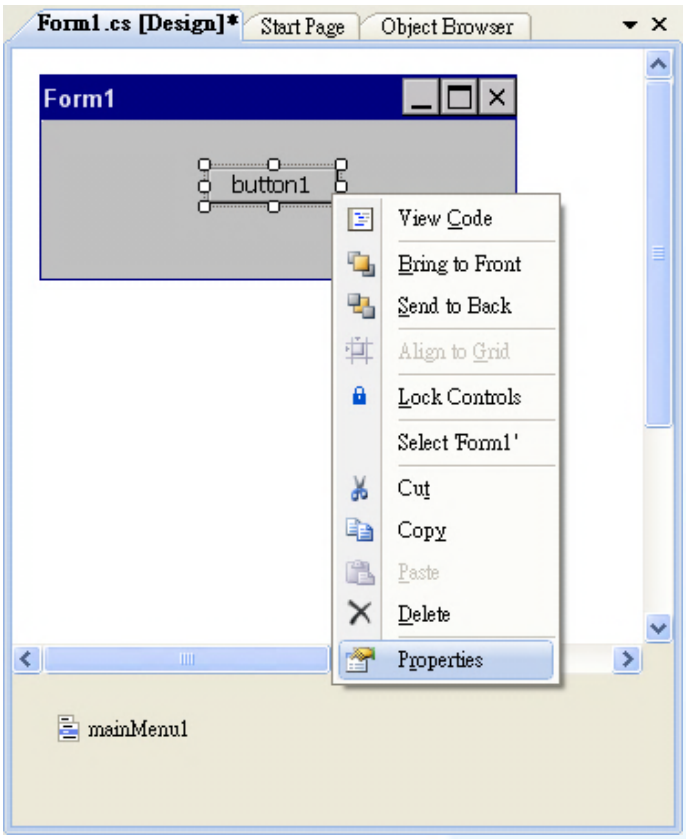
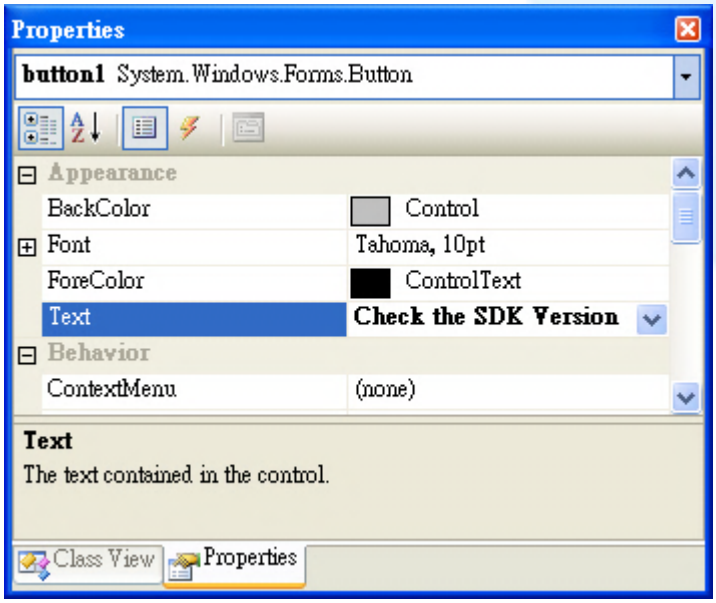
**2.** Right-click the Button control, and then click Properties




**3.** In the Properties window, type Check the SDK version, and press ENTER to set the Text property





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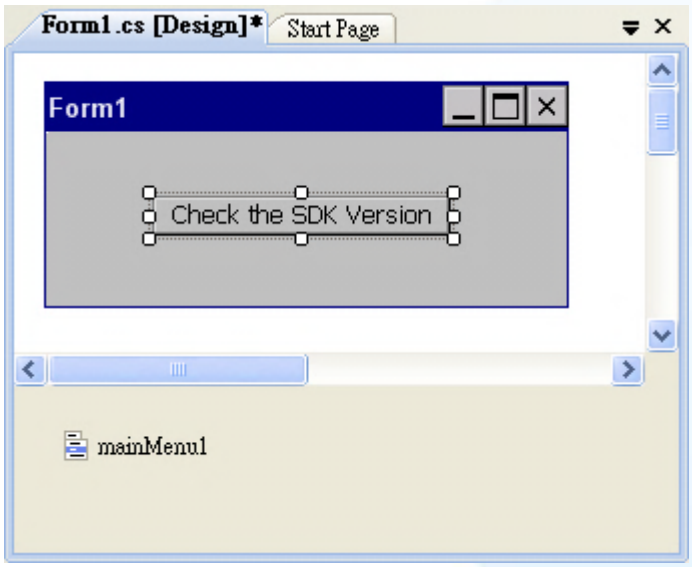
## 5.3.2.4. Adding the Event Handling to the Control

You have finished the design stage of your application and are at the point when you can start adding some code to provide the program's functionality.

**1.** Double-click the button on the form





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**2.** Inserting the following code

MessageBox.Show(XPacNET.XPac.pac_GetXPacSDKVersion());

```
namespace SDKInformation
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            MessageBox.Show(XPacNET.XPac.pac_GetXPacSDKVersion());
        }
    }
}
```



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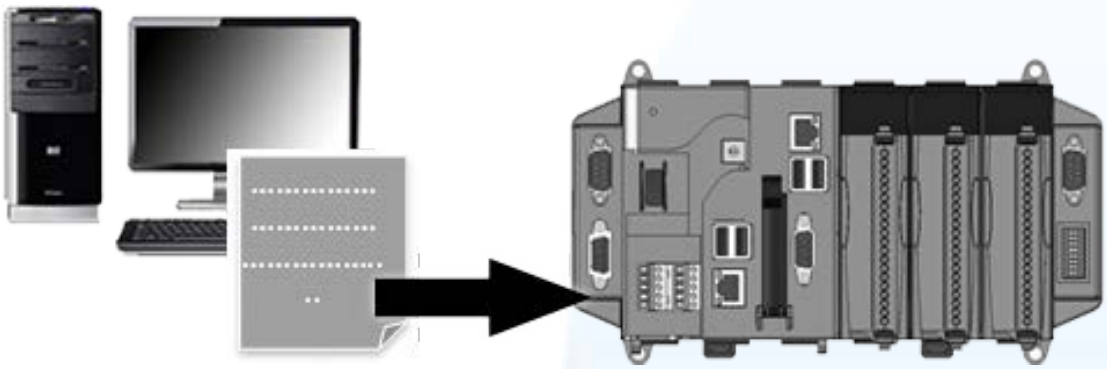
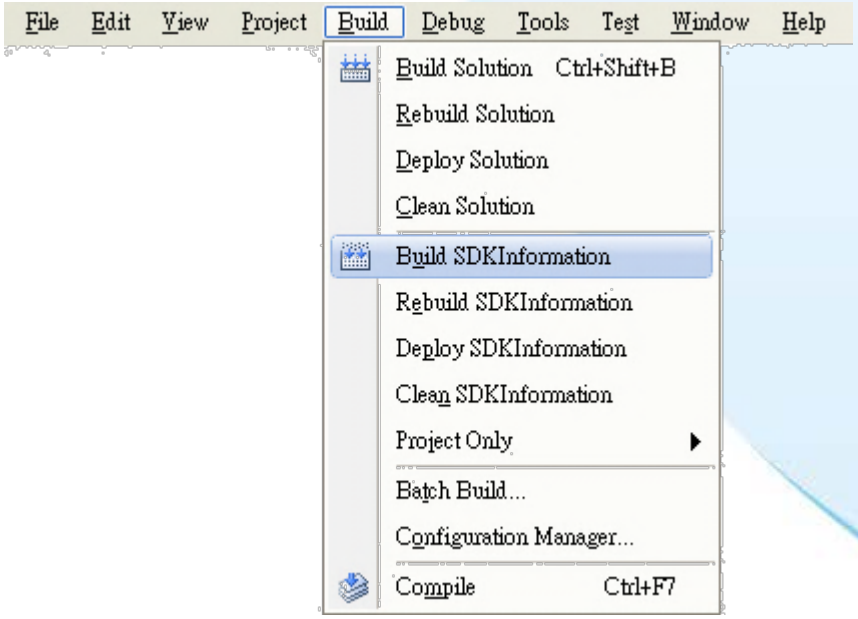
## 5.3.2.5. Uploading the Application to XP-8000-Atom

XP-8000-Atom provide FTP server service, you can upload files to XP-8000-Atom or download files from a public FTP server.



**1.** On the Build menu, click Build SDKInformation





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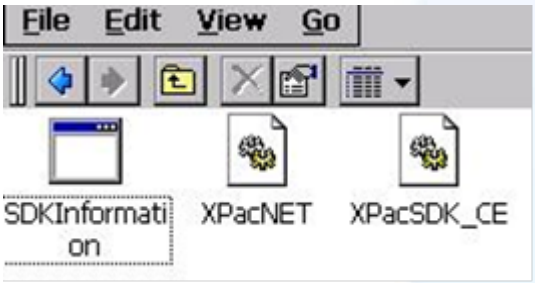
2. Open the browser and type the IP address of XP-8000-Atom

3. Upload the SDKInformation.exe application and the corresponding XPacSDK_CE.dll and XPacNET.dll files to the XPAC

### Tips & Warnings

For applications programming in C# and VB.net with .net compact framework, when executing these application on the XP-8000-Atom, the corresponding XPacSDK_CE.dll and XPacNET.dll must be in the same directory as the .exe file.





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## 5.3.2.6. Executing the Application on XP-8000-Atom

After uploading the application to XP-8000-Atom, you can just double-click it on XP-8000-Atom to execute it.


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### 5.3.3. Your First XP-8000-Atom Program with the Visual C++

Here we will demonstrate how to create a C++ program running on XP-8000-Atom with the Visual C++ development tool

1. Create a new project
2. Configure the platform
3. Specify the path of the XPAC reference
4. Add the control to the form
5. Add the event handling for the control
6. Upload the application to XP-8000-Atom
7. Execute the application on XP-8000-Atom

In this tutorial, we will assume that you have installed XPAC platform SDK on PC and used the Visual Studio 2008 for application development.


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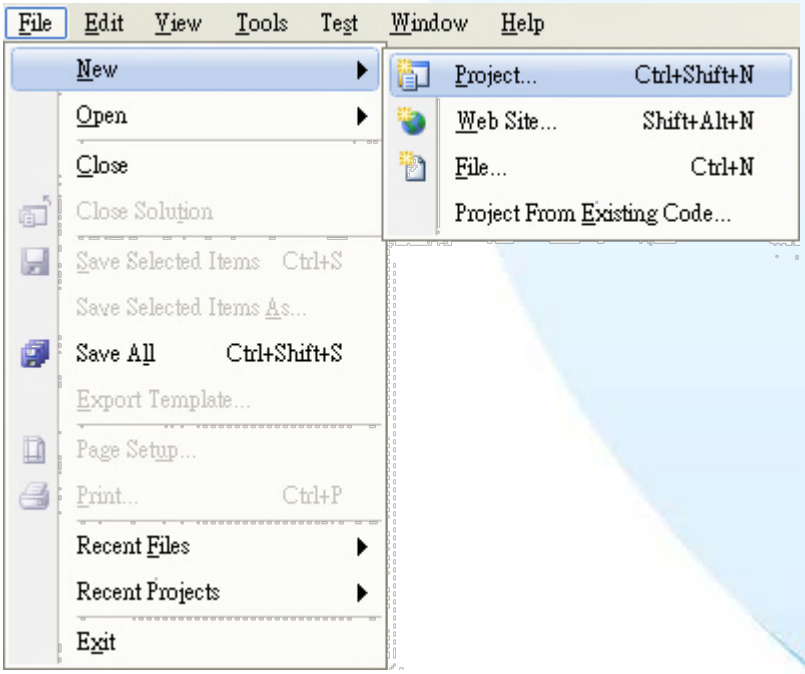
# 5.3.3.1. Creating a New Project

The Visual C++ project template is a composite control that you use in this example creates a new project with this user control.

**1.** Start Visual Studio 2008

**Visual Studio 2008**

**2.** On the File menu, point to New, and then click Project





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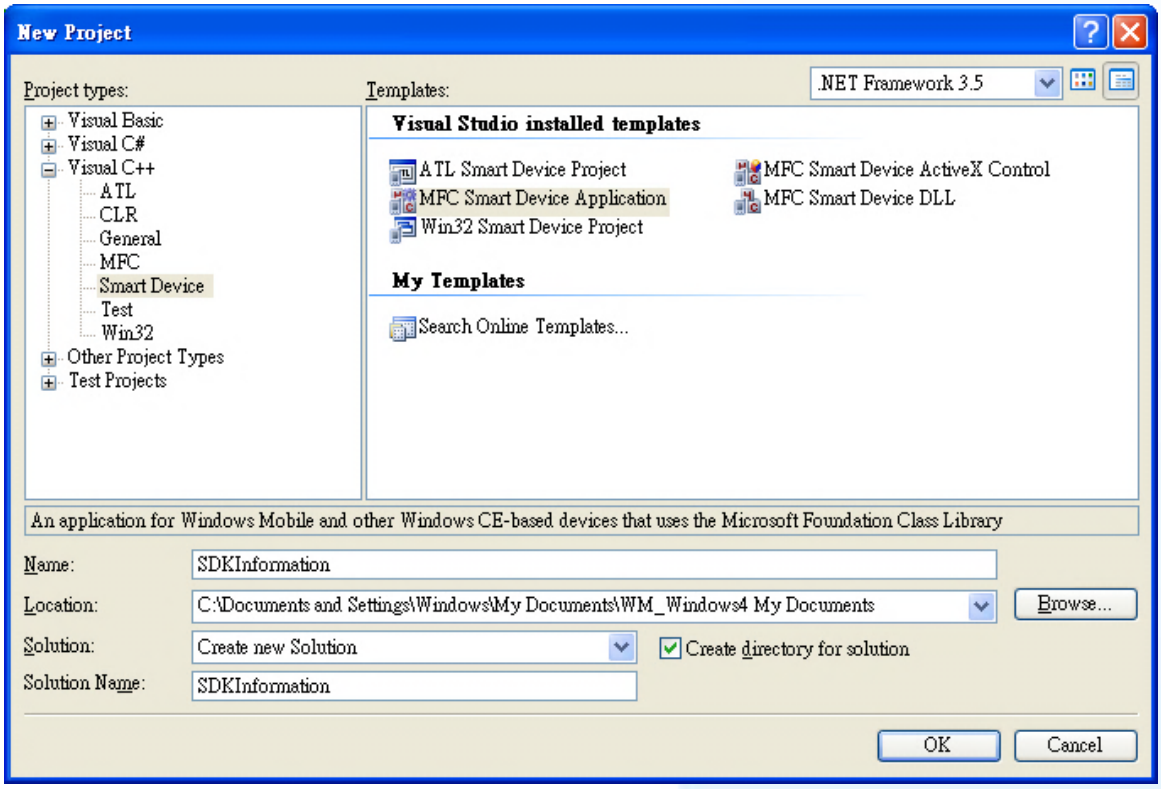
3. In the Project types pane, expand Visual C++, and then click Smart Device
4. In the Templates pane, click MFC Smart Device Application
5. Type a name in the Name field, and then click OK

   Here we will enter the name “SDKInformation” and a different location for the project if you wish





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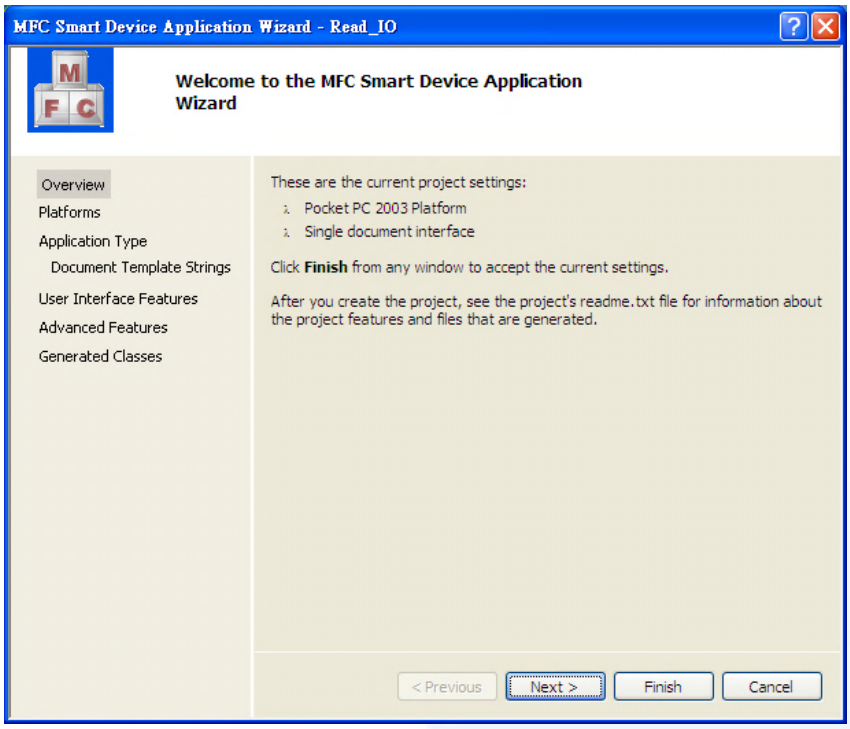
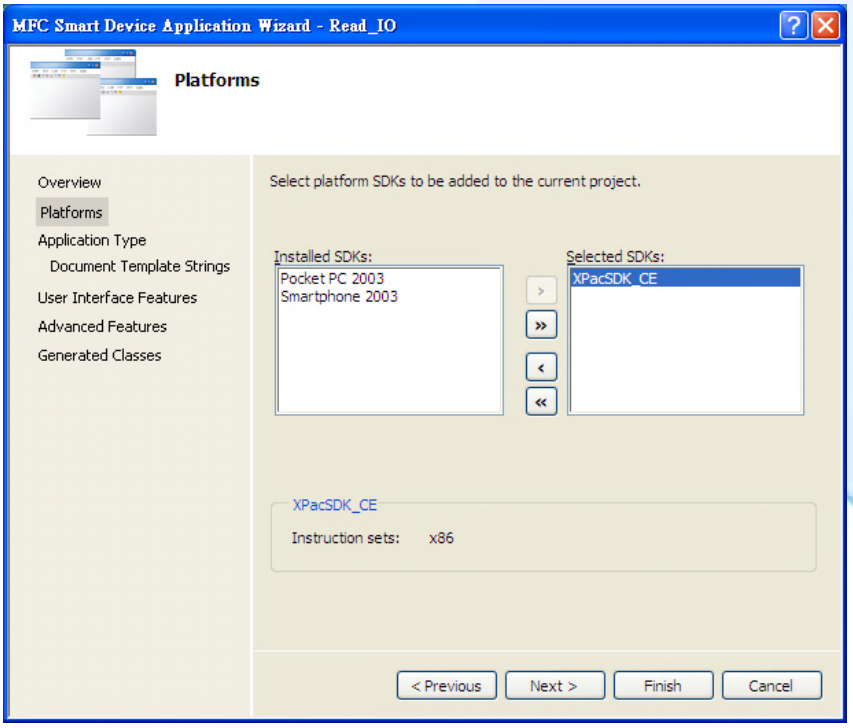
**6.** On the first page of the wizard, click Next


MFC Smart Device Application Wizard - Read_IO
Welcome to the MFC Smart Device Application Wizard
Overview
Platforms
Application Type
Document Template Strings
User Interface Features
Advanced Features
Generated Classes
These are the current project settings:
Pocket PC 2003 Platform
Single document interface
Click Finish from any window to accept the current settings.
After you create the project, see the project's readme.txt file for information about the project features and files that are generated.
< Previous
Next >
Finish
Cancel

**7.** On the next page of the wizard, select XPacSDK_CE to be added to the project, and then click Next





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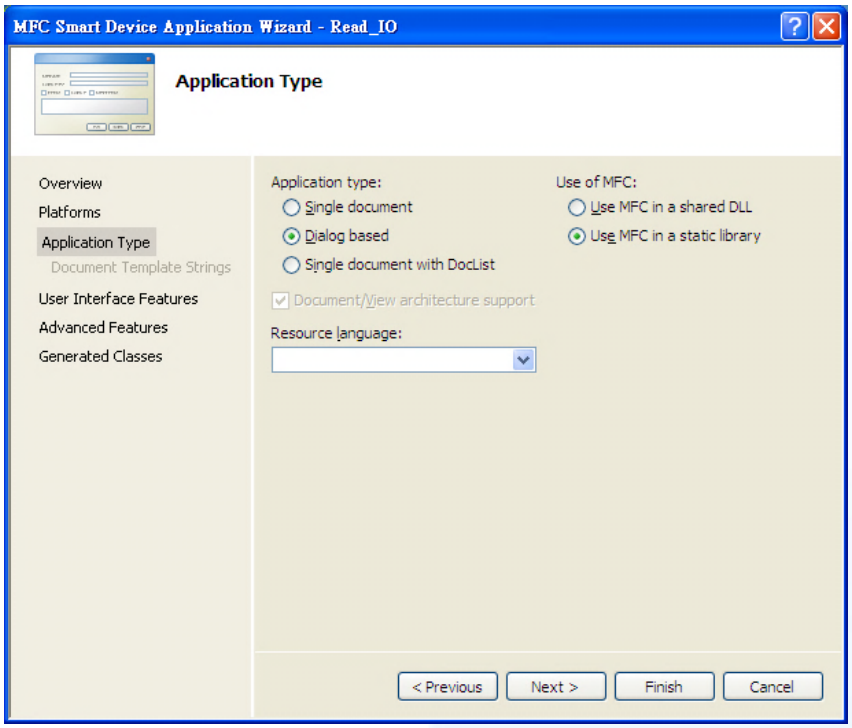
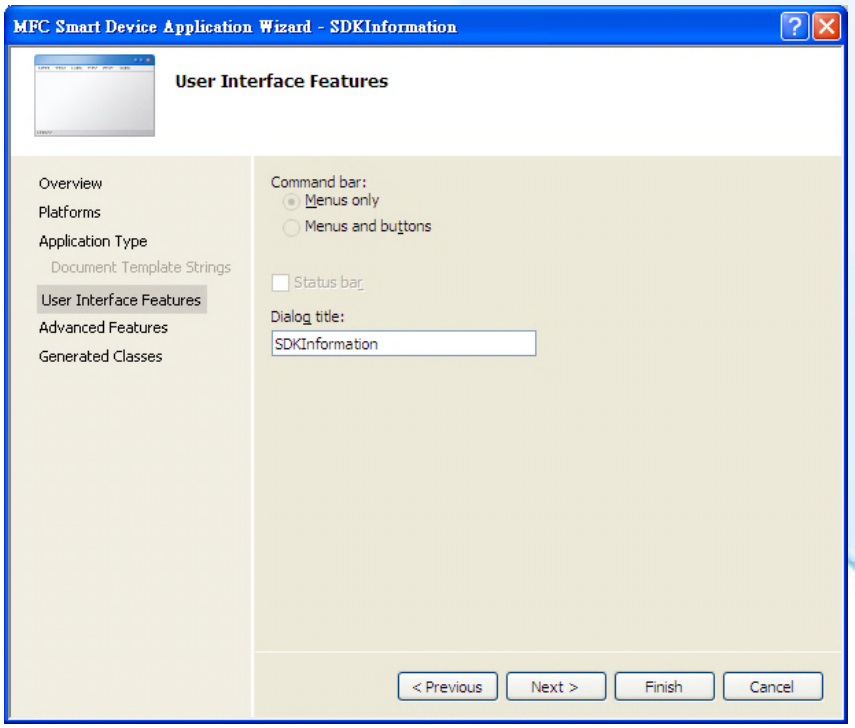
**8.** On the next page of the wizard, select Dialog based, and then click next




**9.** On the next page of the wizard, click next





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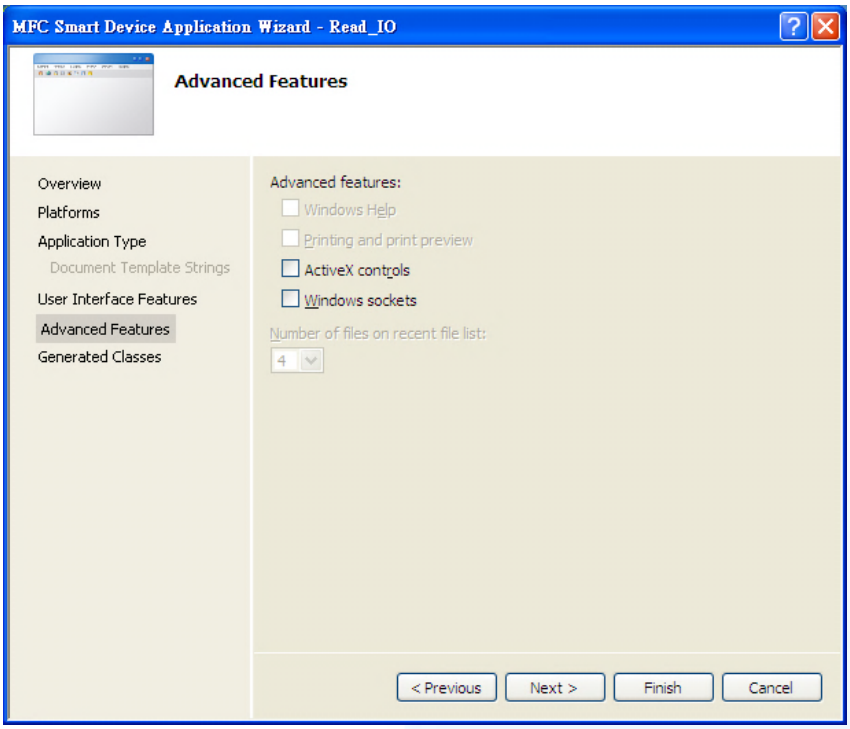
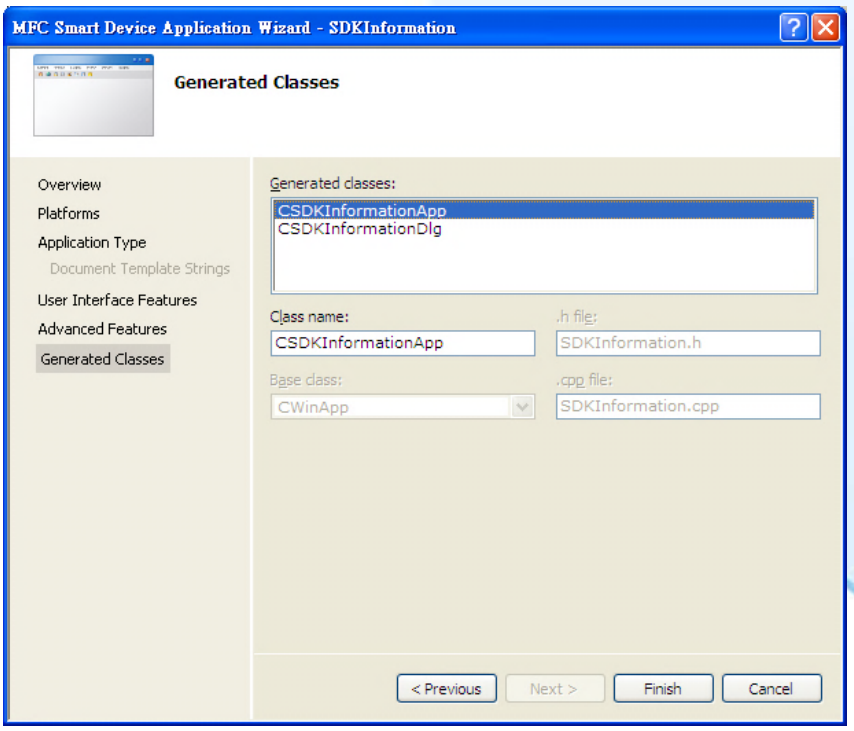
**10.** On the next page of the wizard, click next




**11.** On the next page of the wizard, click Finish





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## 5.3.3.2. Configuring the Platform

When developing applications by using Visual C++, you must configure the Platform to indicate what platform and device you intend to download the application to. Before you deploy your project, check the platform.

On the Debug configuration toolbar, select Release, and then on the Pocket PC 2003 (ARMV4) configuration toolbar, select XPacSDK_CE (x86), as shown in the following illustration.

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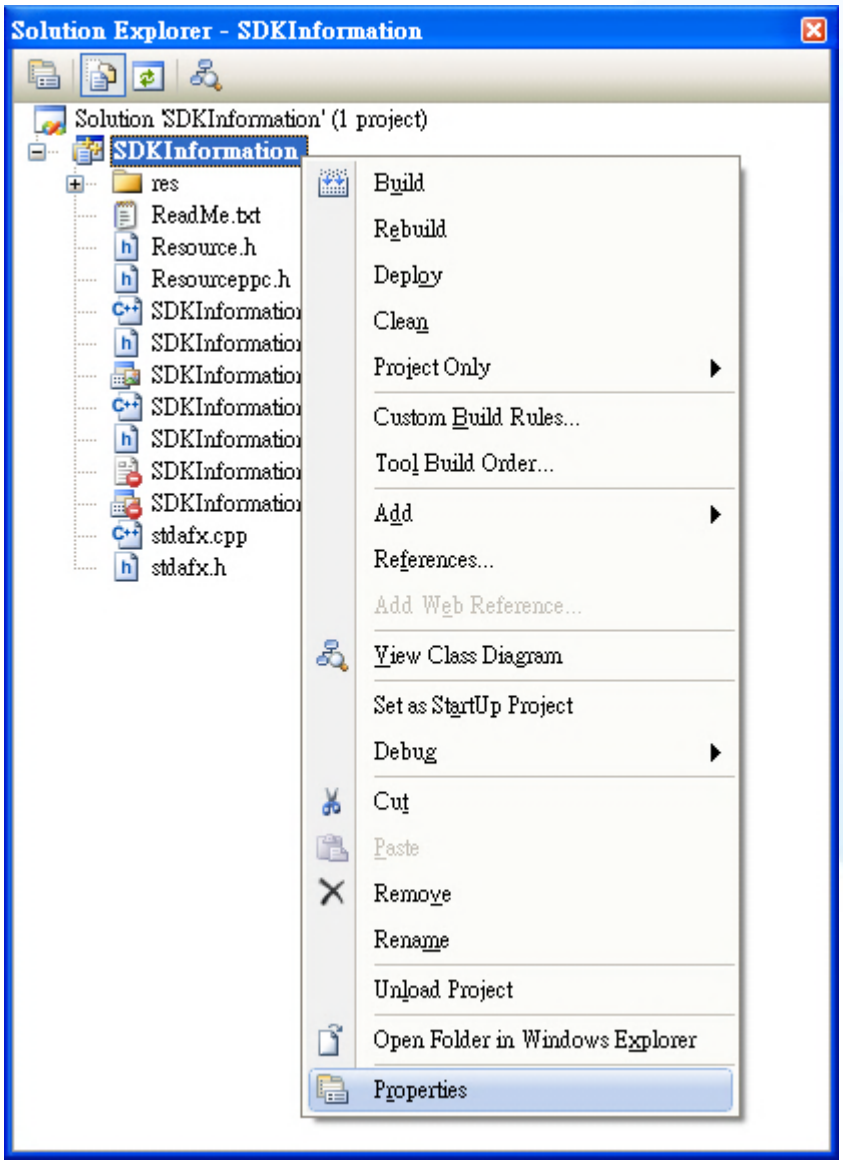
## 5.3.3.3. Specifying the Path of the XPAC Reference

The XPAC SDKs provides a complete solution to integrate with XPAC and it's compatible with Visual C#, Visual Basic .net and C++. In order to use a component in your application, you must first add a reference to it.

**1.** Right-click the project name, and then click Properties





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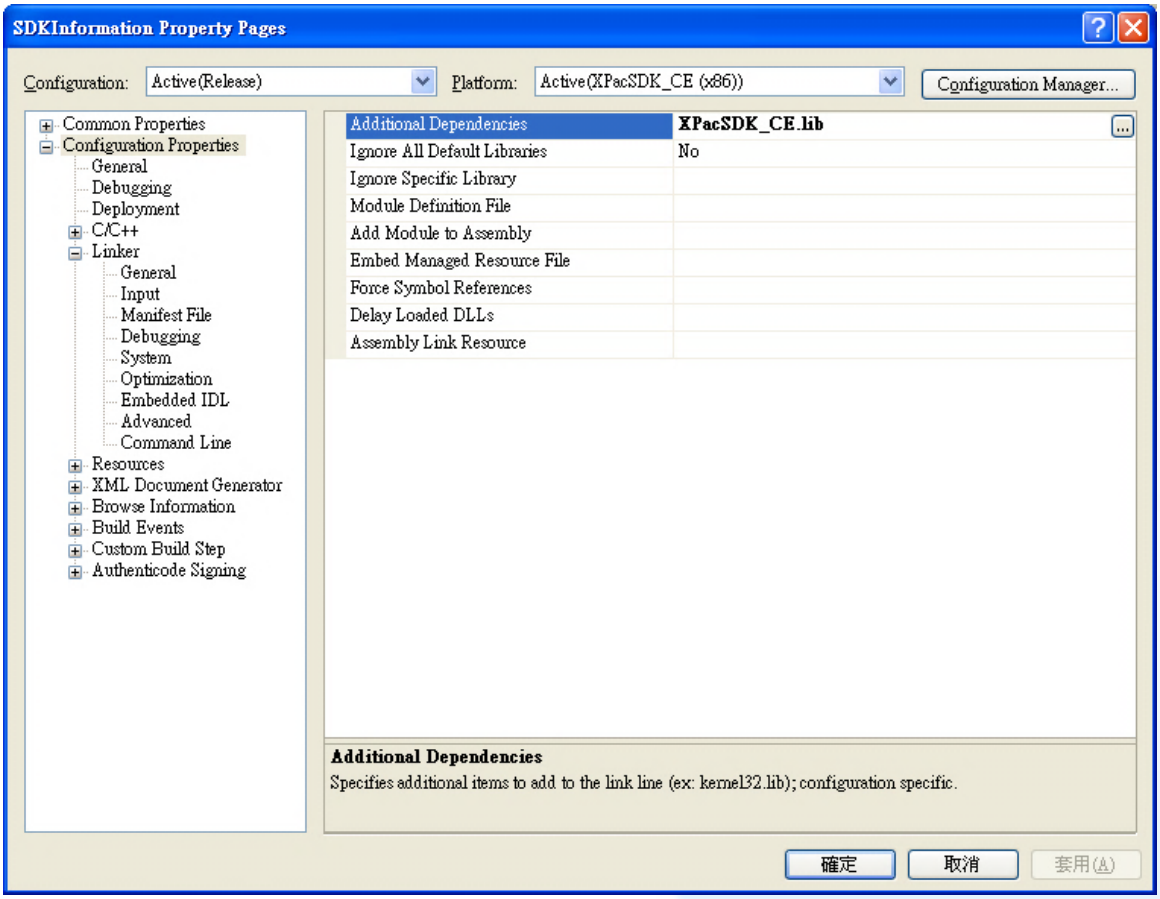
2. In left pane, expand Configuration Properties, and then click Link
3. In the right pane, choose the XPacSDK_CE.lib in the Additional Dependencies item





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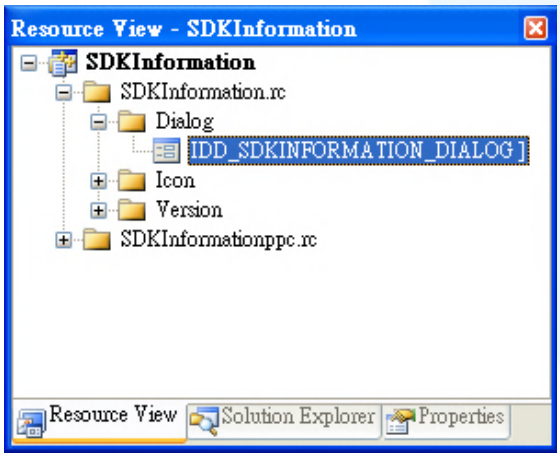
## 5.3.3.4. Adding the Control to the Form

You can drag various controls from the Toolbox onto the form. These controls are not really "live"; they are just images that are convenient to move around on the form into a precise location.

After you add a control to your form, you can use the Properties window to set its properties, such as background color and default text. The values that you specify in the Properties window are the initial values that will be assigned to that property when the control is created at run time.

1. In Resource View, expand the resources tree by opening the top level folder
2. Open the Dialog folder and then double-click the dialog resource name IDD_SDKINFORMATION_DIALOG




The resource editor appears in the right pane.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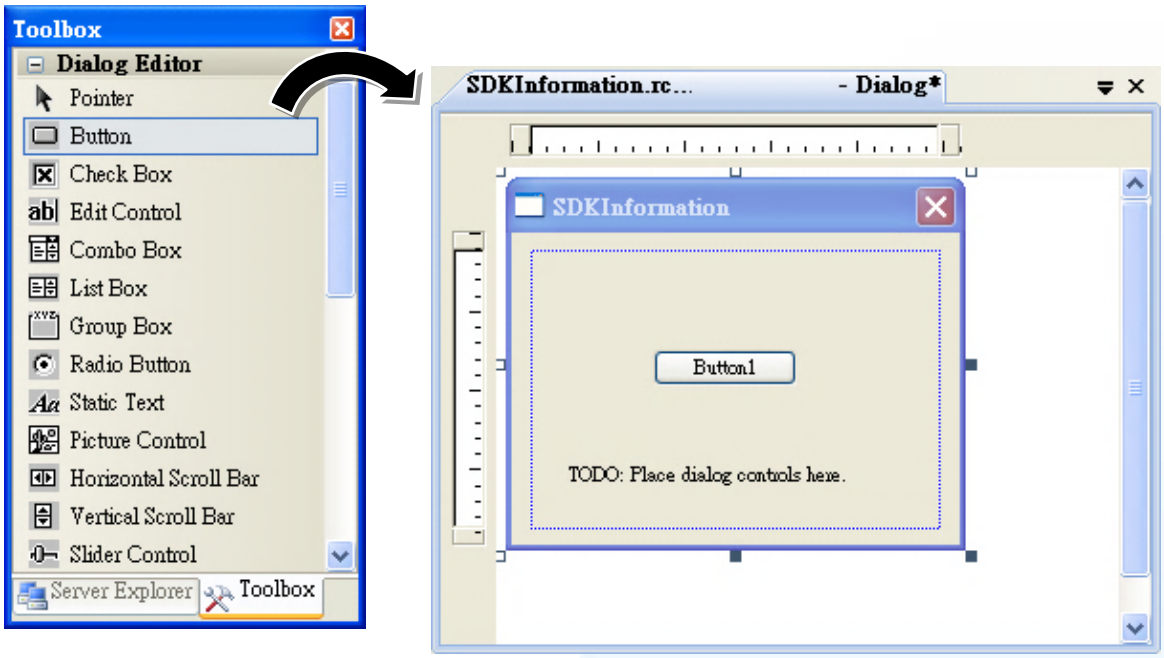
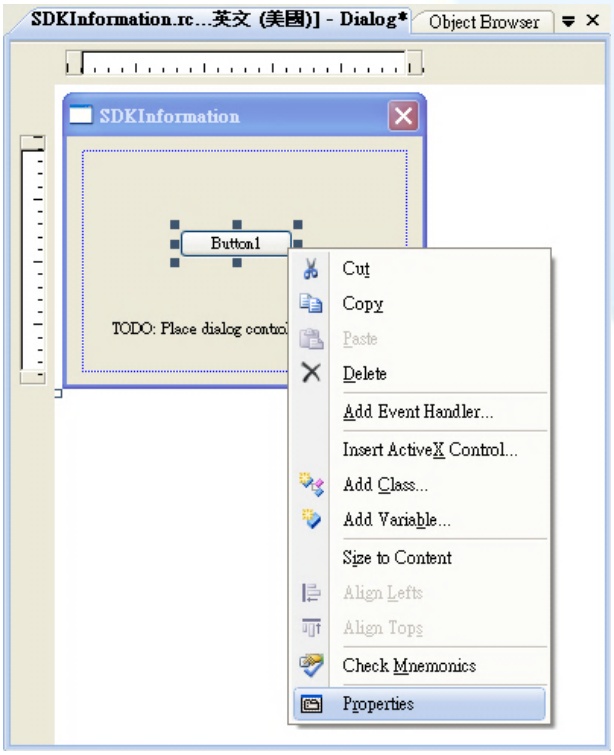
**3.** From the Toolbox, drag a Button control onto the form




**4.** Right-click the Button control, and then click Properties





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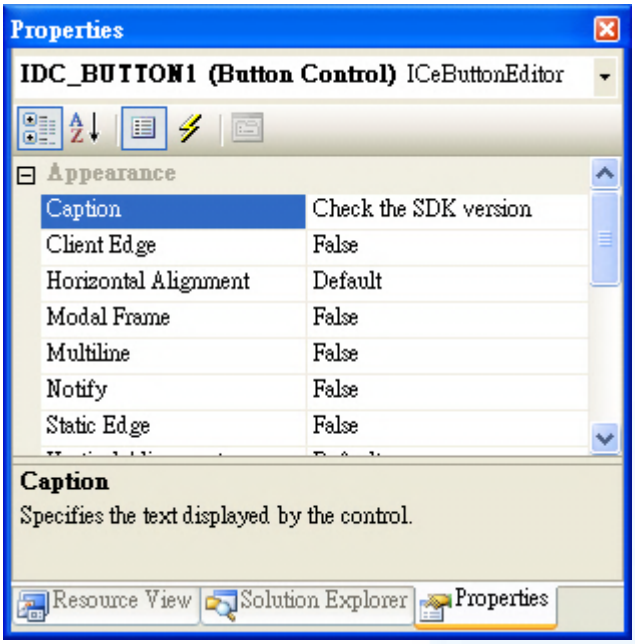
**5.** In the Properties window, type Check the SDK version, and press ENTER to set the Text property





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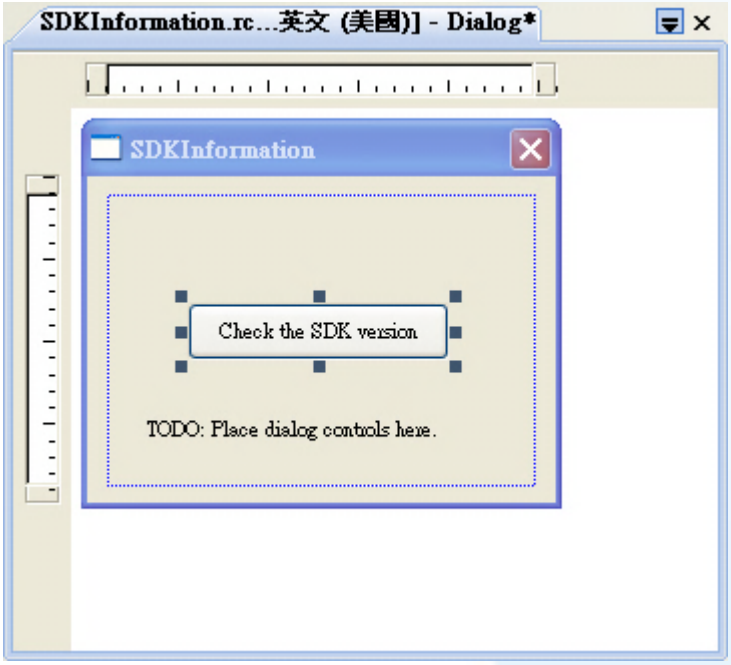
# 5.3.3.5. Adding the Event Handling to the Control

You have finished the design stage of your application and are at the point when you can start adding some code to provide the program's functionality.

**1.** Double-click the button on the form





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**2.** Inserting the following code

char sdk_version[32];

TCHAR buf[32];

pac_GetSDKVersion(sdk_version);

pac_AnsiToWideString(OS, buf);

MessageBox(buf,0,MB_OK);

```
void CSDKInformationDlg::OnBnClickedButton1()
{
    char sdk_version[32];
    TCHAR buf[32];
    pac_GetSDKVersion(sdk_version);
    pac_AnsiToWideString(OS, buf);
    MessageBox(buf,0,MB_OK);


    // TODO: Add your control notification handler code here
}
```

**3.** Inserting the following code into the header area

#include “XPacSDK_CE.h”

```
// SDKInformationDlg.cpp : implementation file
//

#include "stdafx.h"
#include "SDKInformation.h"
#include "SDKInformationDlg.h"

#include "XPacSDK_CE.h"

#ifdef _DEBUG
#define new DEBUG_NEW
#endif
```



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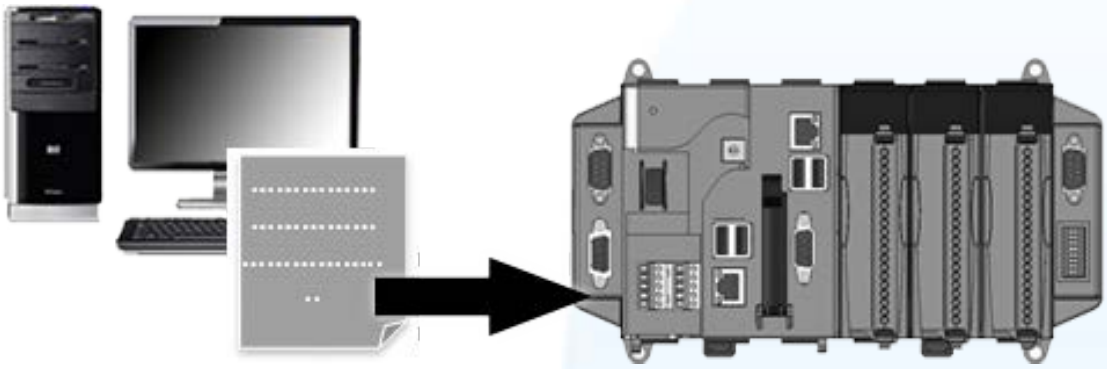
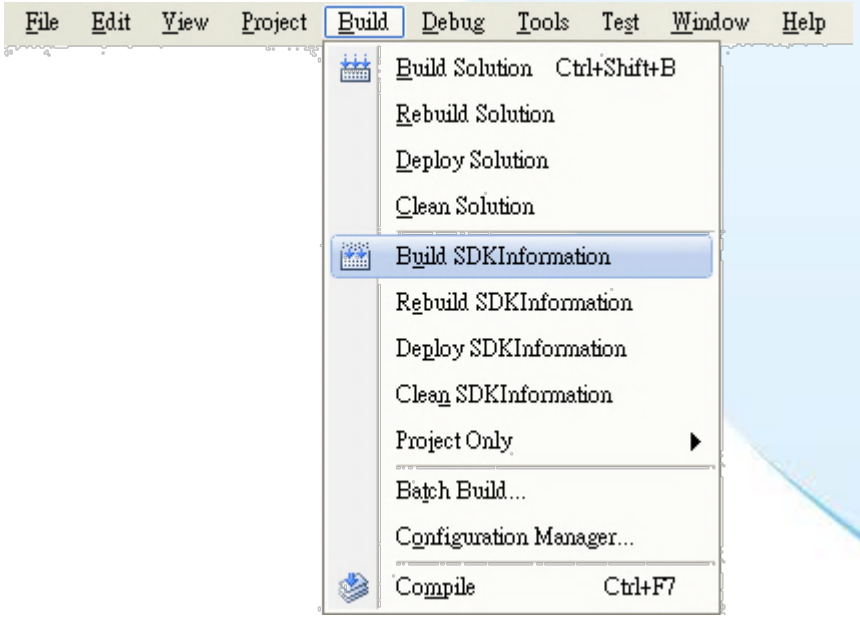
## 5.3.3.6. Uploading the Application to XP-8000-Atom

XP-8000-Atom provide FTP server service, you can upload files to XP-8000-Atom or download files from a public FTP server.



**1.** On the Build menu, click Build SDKInformation





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**2.** Open the browser and type the IP address of XP-8000-Atom

**3.** Upload the SDKInformation.exe application

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## 5.3.3.7. Executing the Application on XP-8000-Atom

After uploading the application to XP-8000-Atom, you can just double-click it on XP-8000-Atom to execute it.


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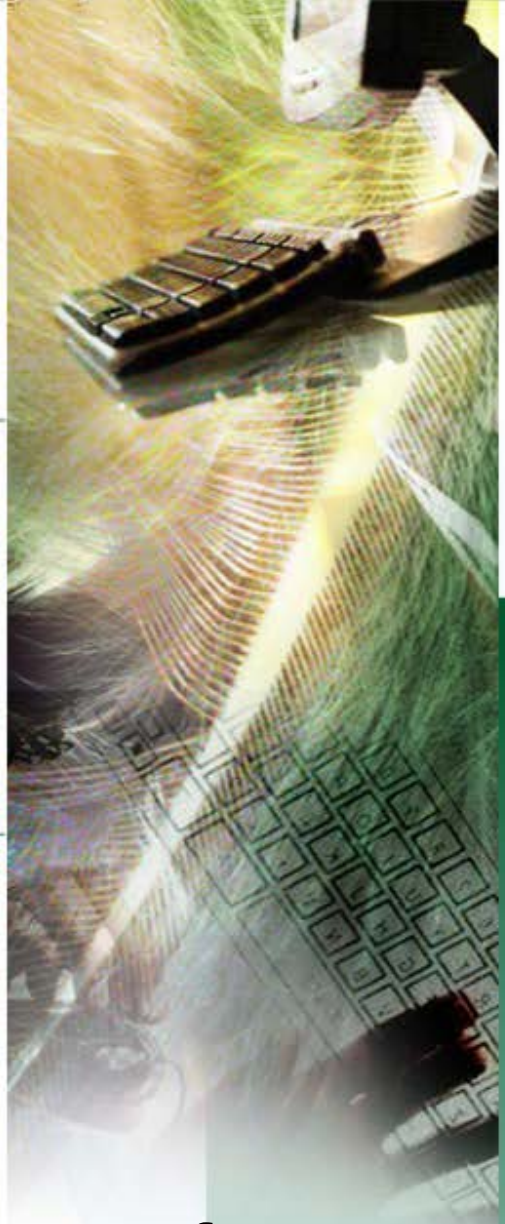

# 6. APIs and Demo References

This chapter provides an introduction to the demo programs that have been designed for the XP-8000-Atom.


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# 6.1. XP-8000-Atom API

The XPAC standard API enables applications to exploit the power of XP-8000-Atom. XP-8000-Atom is a Windows Embedded Standard-based unit. It's a XP like OS. Support more programming language: C/C++/MFC, C#, VB, VB.NET, Delphi, and BCB.

**Supported programming languages include:**

- For C/C++/MFC: XPacSDK.h/XPacSDK.lib/XPacSDK.dll
- For C#/VB.NET: XPacNET.dll
- For VB: XPacSDK.bas
- For Delphi: XPacSDK.pas
- For BCB: XPacSDK_BCB.lib

Each program no matter builds by which language, its execution needs XPacSDK.dll to execute. The XPacSDK must be version 2.0.2.0 and later.

V: Work, X: Don't Work

| API | XP-8000 | PC Windows |
|---|---|---|
| System Information | V | X |
| Backplane Access | V | X |
| Interrupt | V | X |
| Memory Access | V | X |
| Uart | V | V |
| PAC_IO | V | V |

**Note 1:** For the PC windows solution, the Microsoft .NET Framework 2.0 (or above) must be installed on PC.

**Note 2:** The PAC_IO API can be used to connect the I-7000 module and other modules using the DCON protocol.


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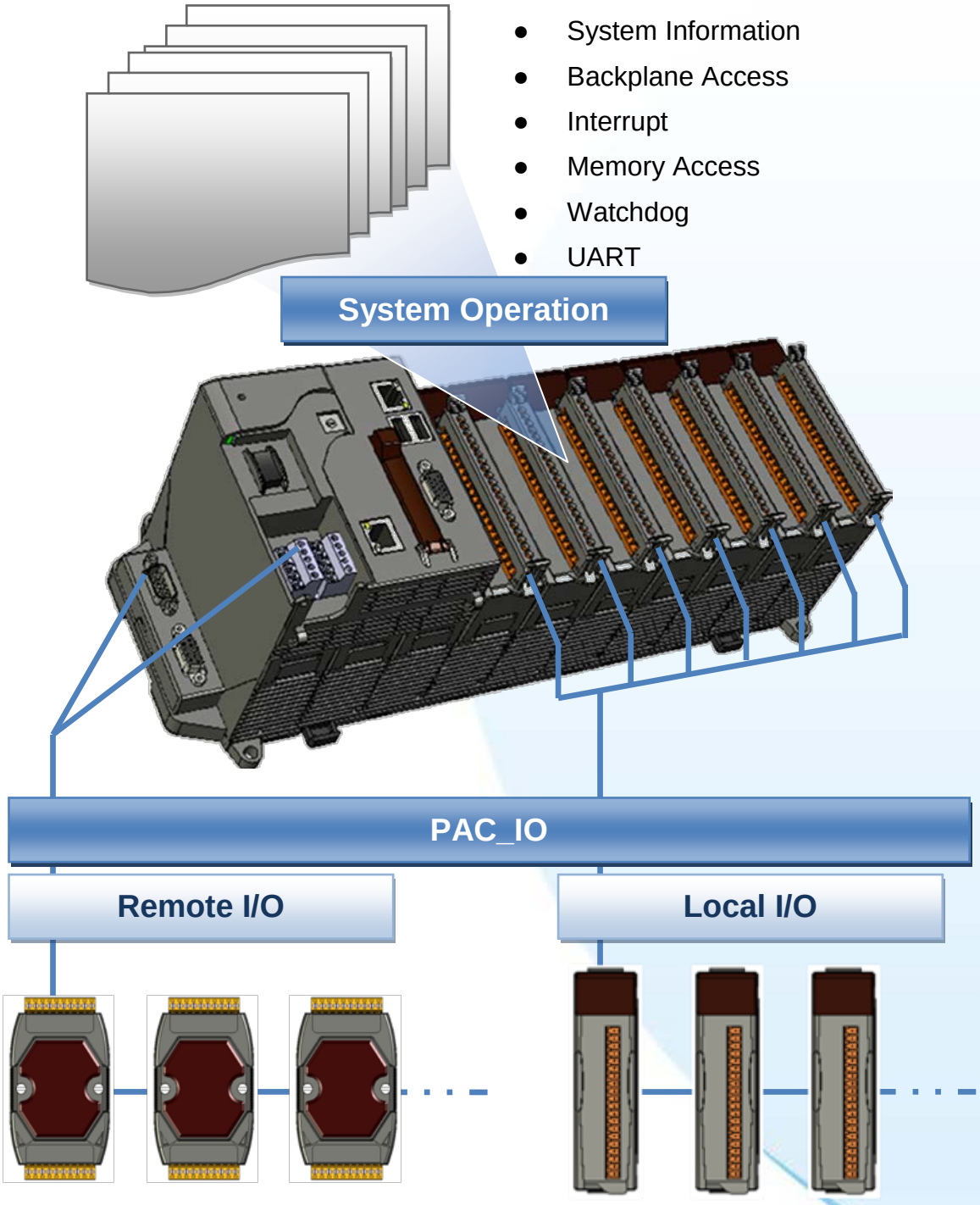
The XPAC standard API consists of the following APIs and functional categories:





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- **System Information Reference**

Provide reference information for the system status.

- **Backplane Access Reference**

Provide reference information for the backplane access APIs.

- **Interrupt Reference**

Provide reference information for the Interrupt APIs

- **Memory Access Reference**

Provide reference information for the memory R/W APIs, including EEPROM and SRAM.

- **Watchdog Reference**

Provide reference information for the watchdog APIs, including hardware watchdog and OS watchdog.

- **Uart Reference**

Provide reference information for the Uart APIs.

- **PAC_IO Reference**

Provide reference information for IO APIs, including local and remote.

In additions, no matter 8K or 87K modules use the same API.

- **Error Handling API Reference**

Provide reference information for error handling.

XPacSDK Standard API


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# 6.2. XP-8000-Atom Demo Programs

ICP DAS provides various demo programs that have been designed for the XP-8000-Atom. You can examine the demo source code, which includes numerous comments, to familiarize yourself with the XP-8000-Atom API. This will allow developing your own applications quickly by modifying these demo programs. The following section lists all available demo programs and describes their function. .


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## 6.2.1. Demo Programs with C#

The table below describes the XP-8000-Atom demos that have been designed to demonstrate the standard operation features.

| Folder | Demo | Explanation |
|---|---|---|
| console | batterylevel | Shows how to get the battery status |
| | errorcodelist | Shows how to get error codes and messages |
| | getdeviceinformation | Shows how to get the system information including serial number, SDK version, backplane ID, …etc |
| | moduleexists | Shows how to check whether a specified module exists |
| | pac_readai | Shows how to read data from a AI module |
| | pac_readao | Shows how to read data from a AO module |
| | pac_readcnt | Shows how to read data from the counter/frequency module |
| | pac_readdi | Shows how to read data from a DI module |
| | pac_readdicnt | Shows how to read data from a DI module |
| | pac_readdilatch | Shows how to read the amount of the DI channel from a DI module |
| | pac_readdio | Shows how to read data from a DIO module |
| | pac_writeao | Shows how to write data to a AO module |
| | pac_writedo | Shows how to write data to a |


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| | | |
|---|---|---|
| | | DO module |
| | pac_writedobit | Shows how to write a single bit of data to a DO module |
| | readdo7k87k | Shows how to read data from a local and remote DO module |
| | readmemory | Shows how to read data from the specified memory |
| | uart_sendcmd | Shows how to send commands through the COM port |
| | watchdog | Shows how to configure the watchdog timer |
| | writememory | Shows how to write data to the specified memory |
| windows forms | deviceinformation | Shows how to get the system information including serial number, SDK version, backplane ID, …etc. |
| | diagnostic | Shows how to diagnose driver problems |
| | dip | Shows how to read the status of the DIP switch |
| | getrotaryid | Shows how to read the operating system according to the rotary switch |
| | io\ai_demo | Shows how to read data from a AI module |
| | io\ao_demo | Shows how to read data from a AO module |
| | io\cnt_demo | Shows how to read data from the counter/frequency module |
| | io\di_demo | Shows how to read data from a DI module |
| | io\di_demo_with_latc | Shows how to read data from |


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| | | |
|---|---|---|
| | **h_counter** | **a DI module** |
| | **io\dio_demo** | **Shows how to read data from a DIO module** |
| | **io\dio_demo_with_latch** | **Shows how to read data from a DIO module** |
| | **io\do_demo** | **Shows how to write data to a DO module** |
| | **memory** | **Shows how to enable/disable the EEEPROM and read/write data from/to the memory** |
| | **uart** | **Shows how to send commands through the COM port** |
| | **watchdog** | **Shows how to configure the watchdog timer** |

For C# application, these demo programs can be obtained from:

CD:\XPAC-Atom\Demo\General_API\csharp.net\

http://ftp.icpdas.com/pub/cd/xpac-atom/demo/general_api/csharp.net/


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## 6.2.2. Demo Programs with VB

The table below describes the XP-8000-Atom demos that have been designed to demonstrate the standard operation features.

| Folder | Demo | Explanation |
|---|---|---|
| **i-8k di demo** | **i-8k_di** | **Shows how to read data from a AI module** |
| **i-8k do demo** | **i-8k do** | **Shows how to write data to a DO module** |
| **i-87k ai demo** | **i-87k ai** | **Shows how to read data from a AI module** |
| **i-87k ao demo** | **i-87k ao** | **Shows how to read data from a AO module** |
| **system info** | **system info demo** | **Shows how to get the system information including module name, backplane ID, …etc** |

For C# application, these demo programs can be obtained from:

CD:\XPAC-Atom\Demo\General_API\vb\

http://ftp.icpdas.com/pub/cd/xpac-atom/demo/general_api/vb/


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## 6.2.3. Demo Programs with VB.net

The table below describes the XP-8000-Atom demos that have been designed to demonstrate the standard operation features.

| Folder | Demo | Explanation |
|---|---|---|
| deviceinformation | deviceinformation | Shows how to get the system information including serial number, SDK version, …etc |
| diagnostic | diagnostic | Shows how to diagnose driver problems |
| dip | dip | Shows how to read the status of the DIP switch |
| getrotaryid | getrotaryid | Shows how to read the operating system according to the rotary switch |
| io | io\ai_demo | Shows how to read data from a AI module |
| | io\ao_demo | Shows how to read data from a AO module |
| | io\cnt_demo | Shows how to read data from the counter/frequency module |
| | io\di_demo | Shows how to read data from a DI module |
| | io\di_demo_with_latch_counter | Shows how to read data from a DI module |
| | io\dio_demo | Shows how to read data from a DIO module |
| | io\dio_demo_with_latch | Shows how to read data from a DIO module |
| | io\do_demo | Shows how to write data to a DO module |
| memory | memory | Shows how to enable/disable the EEEPROM and read/write |


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| | | |
|---|---|---|
| | | **data from/to the memory** |
| **uart** | **uart** | **Shows how to send commands through the COM port** |
| **watchdog** | **watchdog** | **Shows how to configure the watchdog timer** |

For C# application, these demo programs can be obtained from:

CD:\XPAC-Atom\Demo\General_API\vb.net\

http://ftp.icpdas.com/pub/cd/xpac-atom/demo/general_api/vb.net/


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## 6.2.4. Demo Programs with Visual C++

The table below describes the XP-8000-Atom demos that have been designed to demonstrate the standard operation features.

| Folder | Demo | Explanation |
|---|---|---|
| batterylevel | batterylevel | Shows how to get the battery status |
| getdeviceinformation | getdeviceinformation | Shows how to get the system information including serial number, SDK version, backplane ID, …etc |
| moduleexists | moduleexists | Shows how to check whether a specified module exists |
| pac_readai | pac_readai | Shows how to read data from a AI module |
| pac_readao | pac_readao | Shows how to read data from a AO module |
| pac_readdi | pac_readdi | Shows how to read data from a DI module |
| pac_readdio | pac_readdio | Shows how to read data from a DIO module |
| pac_writeao | pac_writeao | Shows how to write data to a AO module |
| pac_writedo | pac_writedo | Shows how to write data to a DO module |
| pac_writedobit | pac_writedobit | Shows how to write a single bit of data to a DO module |
| readdo7k87k | readdo7k87k | Shows how to read data from a local and remote DO module |


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| | | |
|---|---|---|
| **readmemory** | **readmemory** | **Shows how to read data from the specified memory** |
| **uart_sendcmd** | **uart_sendcmd** | **Shows how to send commands through the COM port** |
| **writememory** | **writememory** | **Shows how to configure the watchdog timer** |

For C# application, these demo programs can be obtained from:

CD:\XPAC-Atom\Demo\General_API\vc\

http://ftp.icpdas.com/pub/cd/xpac-atom/demo/general_api/vc/


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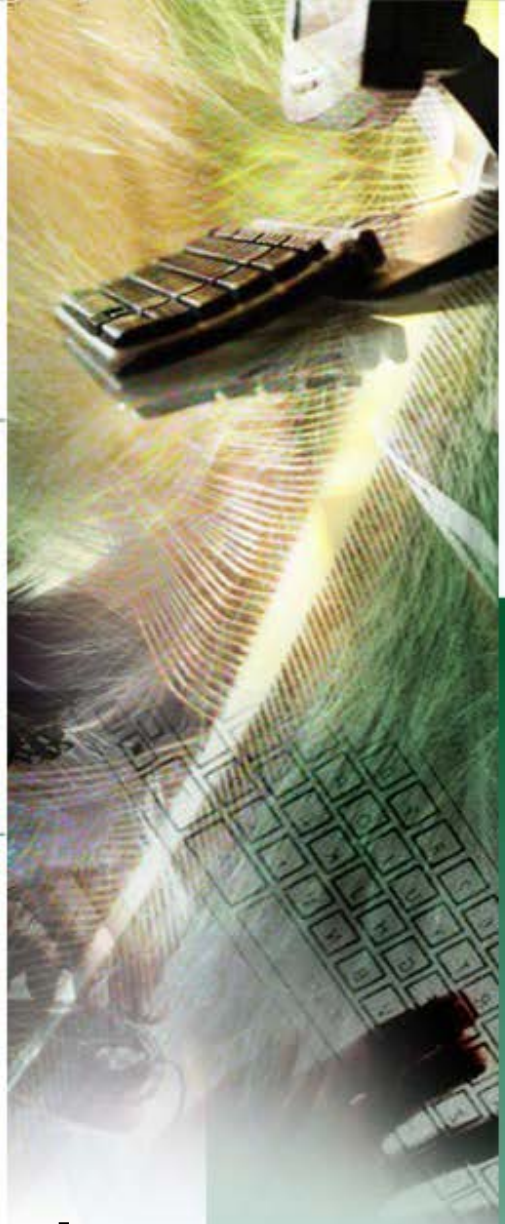

# 7. Your First Database

This chapter provides a guided tour that describes the steps needed to create a SQL Server Database.


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In XP-8000-Atom, you can access SQL Server Compact Edition databases by using SQL Server Management Studio in SQL Server or SQL Server Management Studio Express (SSMSE).

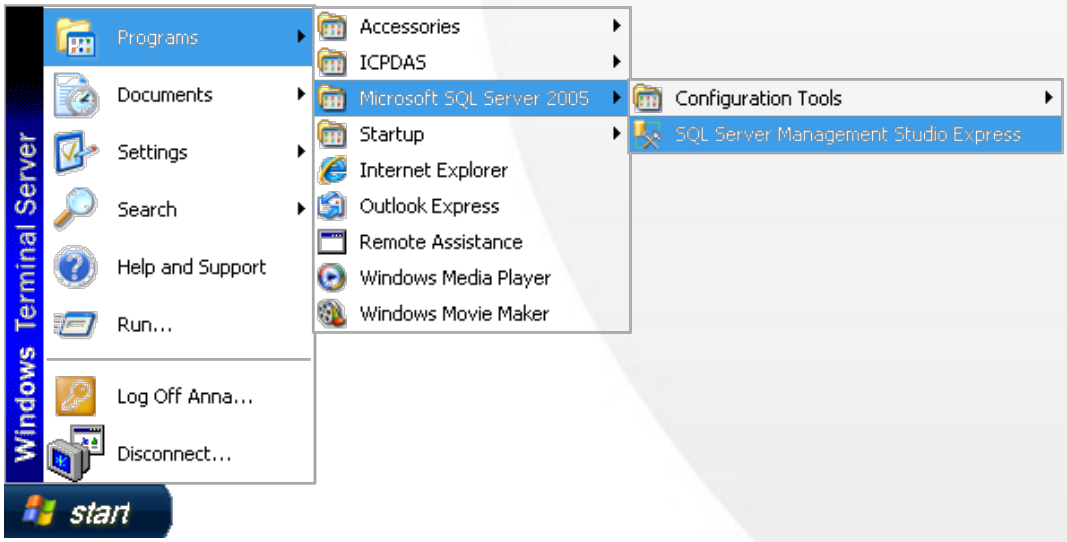
The SSMSE user interface is a subset of SQL Server Management Studio. SSMSE is a free, easy-to-use graphical management tool for managing SQL Server 2005/2008 Express Edition and SQL Server 2005/2008 Express Edition with Advanced Services.

http://www.microsoft.com/downloads/details.aspx?FamilyId=C243A5AE-4BD1-4E3D-94B8-5A0F62BF7796&displaylang=en

In this article, we will use SSMSE to create a simple database.

**To start the SSMSE**

On the **Start** menu, point to **Programs**, point to **Microsoft SQL Server 2005**, and then click **SQL Server Management Studio Express**





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# 7.1. Connecting to Server

Use this dialog to view or specify options when connecting to Microsoft SQL Server 2005 Database Engine. In most cases, you can connect by entering the computer name of the database server in the Server name box and then clicking Connect.

After starting the SSMSE, the **Connect to server** dialog will appear, enter the default login name in the **Login** box and default password in the **Password** box, as shown below.

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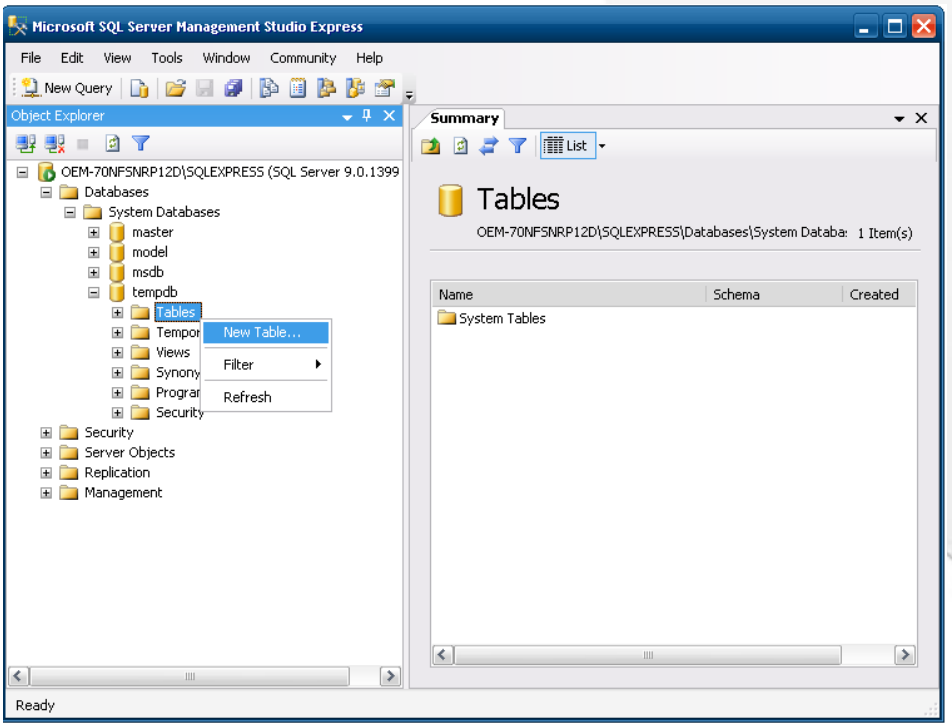
# 7.2. Creating a Table

To create a table, you must provide a name for the table, and the names and data types of each column in the table. It is also a good practice to indicate whether null values are allowed in each column.

Most tables have a primary key, made up of one or more columns of the table. A primary key is always unique. The Database Engine will enforce the restriction that any primary key value cannot be repeated in the table.

**To create a table**

1. In Object Explorer pane, expand the resources tree by opening the top level folder, and then expand the **Databases** folder, the **System Databases**, and the **tempdb** folder
2. Right-click the **Tables** folder, and from the menu, select **New Table…**.





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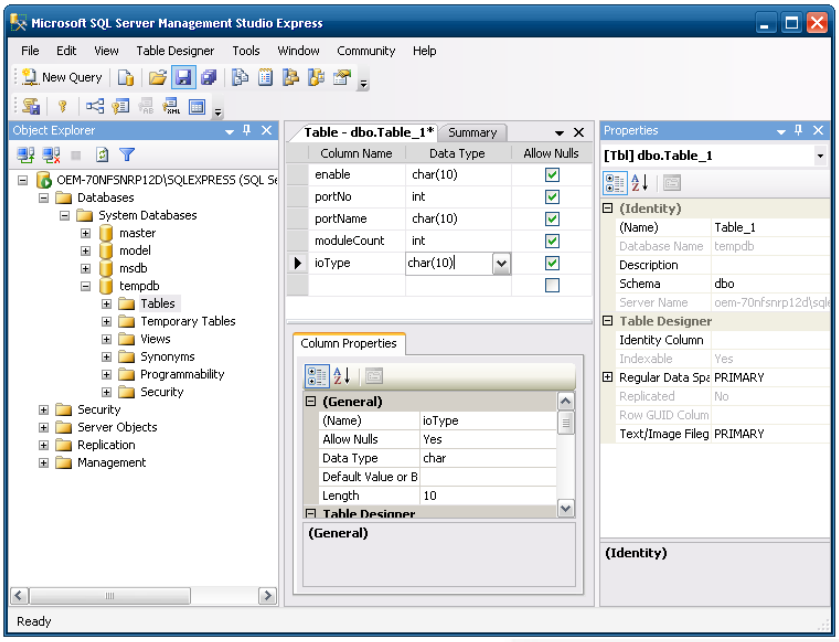
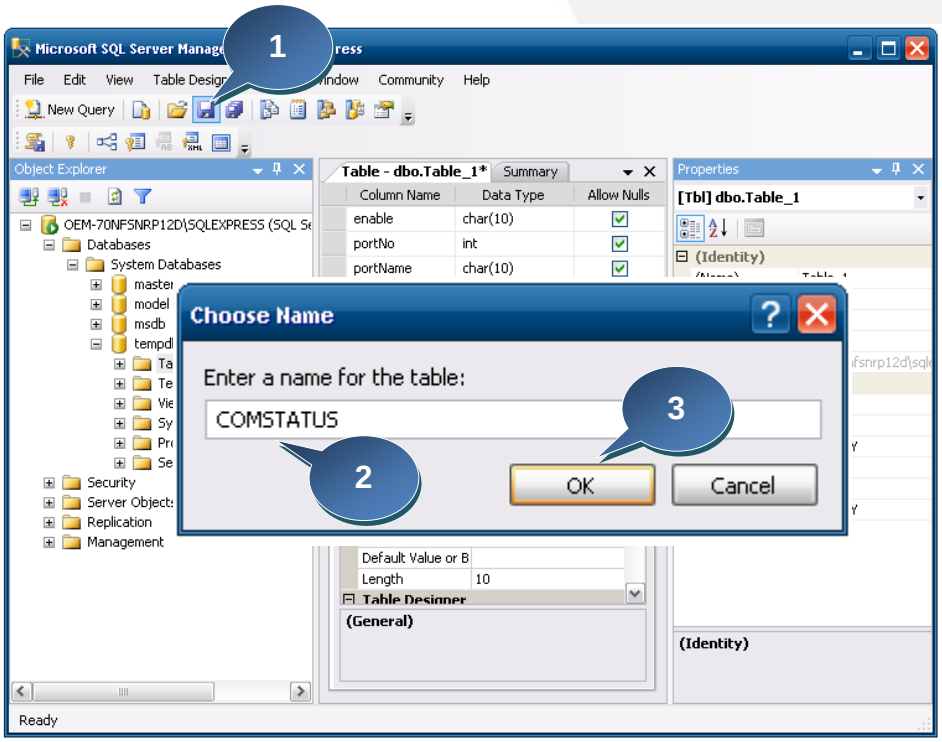
## 3. Create columns aliases

In the **Grid** pane, move to the first blank grid row where you want to add the column, click the field in the **Column** column, and select a column name from the list




## 4. Save the table





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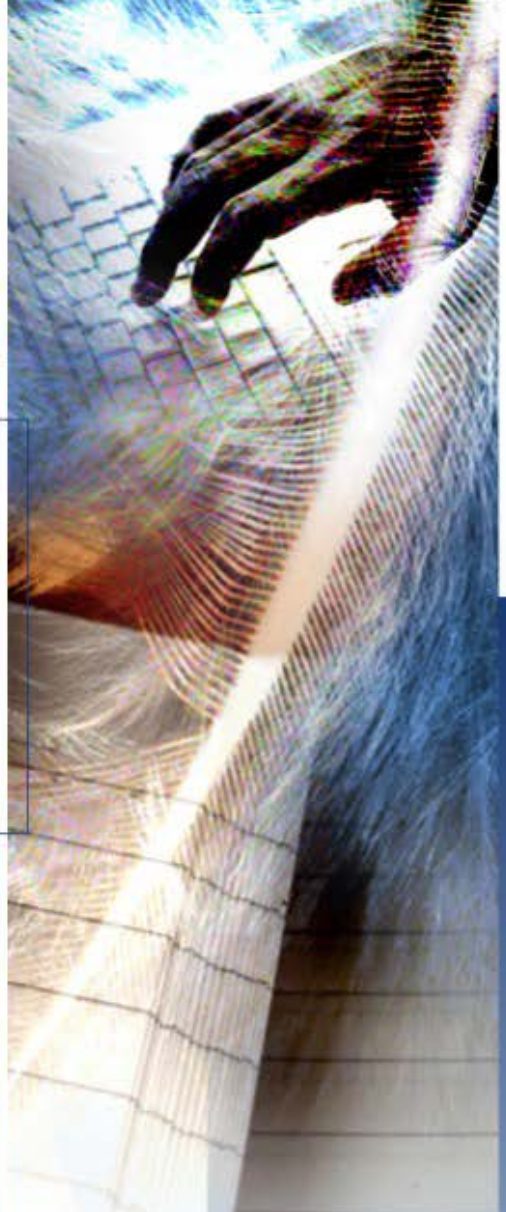

# 8. Restore and Recovery

This chapter provides information of the XP-8000-Atom restore and recovery, and a guided tour that describes the steps needed to restore and recovery the XP-8000-Atom.


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The XP-8000-Atom come with a recuse CF card that is a tool that you can use to boot the XP-8000-Atom in the event that the operating system on the XP-8000-Atom fails to start.

The recovery file of the recuse CF card can be found separately on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\XPAC-Atom\Rescue_Disk\

ftp://ftp.icpdas.com/pub/cd/xpac-atom/rescue_disk/


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# 8.1. Recovering the XP-8000-Atom

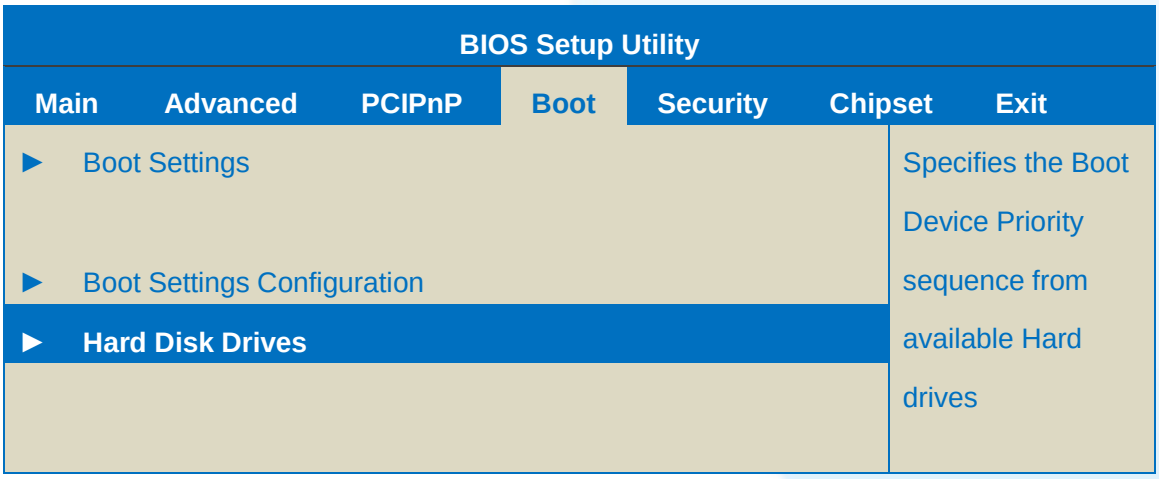
The XP-8000-Atom come with a recuse CF card that is a tool that allows users to restore the XP-8000-Atom to factory default settings by reinstalling the XP-8000-Atom OS image. If the XP-8000-Atom crashes and won't start up, you can use the rescue CF card to start up the XP-8000-Atom computer and then fix the problem that caused the crash.

**To recovery the XP-8000-Atom**

1. Plug the **Rescue** CF card into CF slot

2. Restart XP-8000-Atom, enter the BIOS by pressing **Delete** key

3. Select **Boot** menu, select **Hard Disk Drives**, and then press **Enter** key





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4. Select **1st Drive** and then press **Enter** key

5. Set **1st Drive** as **PS-XXX**, it specifies the XP-8000-Atom to boot form CF card

| BIOS Setup Utility | | | | | | |
|---|---|---|---|---|---|---|
| Main | Advanced | PCIPnP | Boot | Security | Chipset | Exit |
| Hard Disk Drivers | | | | | | Specifies the Boot sequence from available drives |
| **1st Drive** | | | | | **[SATA: PS-XXX]** | |
| 2nd Drive | | | | | [SATA: PM-XXX] | |

6. Press **F10**, and then select **OK** to exit setup utility

   The system will restart and enter the XP-8000-Atom Rescue Utility.

7. Enter 1, **(1) Recover XP-8000-Atom to factory default**

   The system will recovery to the factory default settings, and wait a while until the system enter the XP-8000-Atom Rescue Utility again.

```
*********************************************
*     XP-8000-Atom Rescue Disk -- Main Menu     *
*********************************************


Choose one of the followings:

(1) Recover XP-8000-Atom to factory default
(2) Upgrade XP-8000-Atom manually
(3) Display Drive [C]
(4) Quit rescue disk and reboot
(5) Command shell

Enter choice: 1
```


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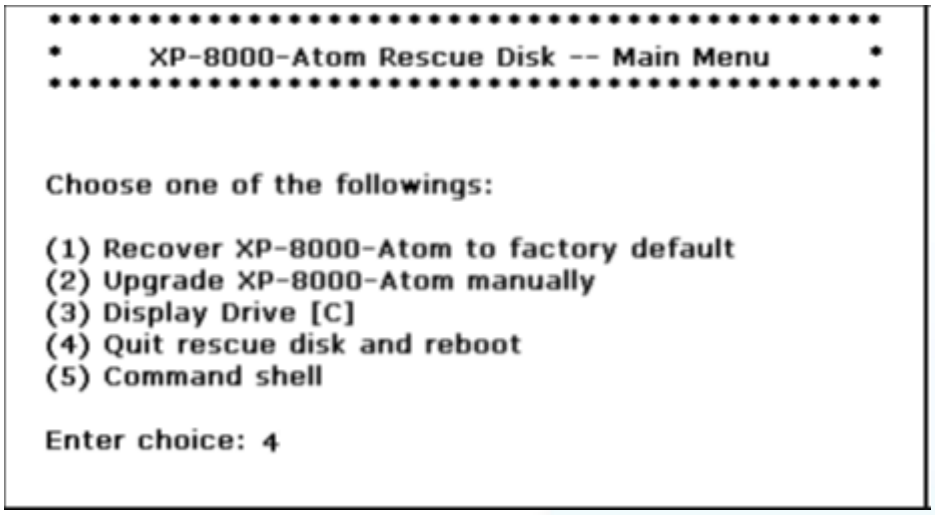
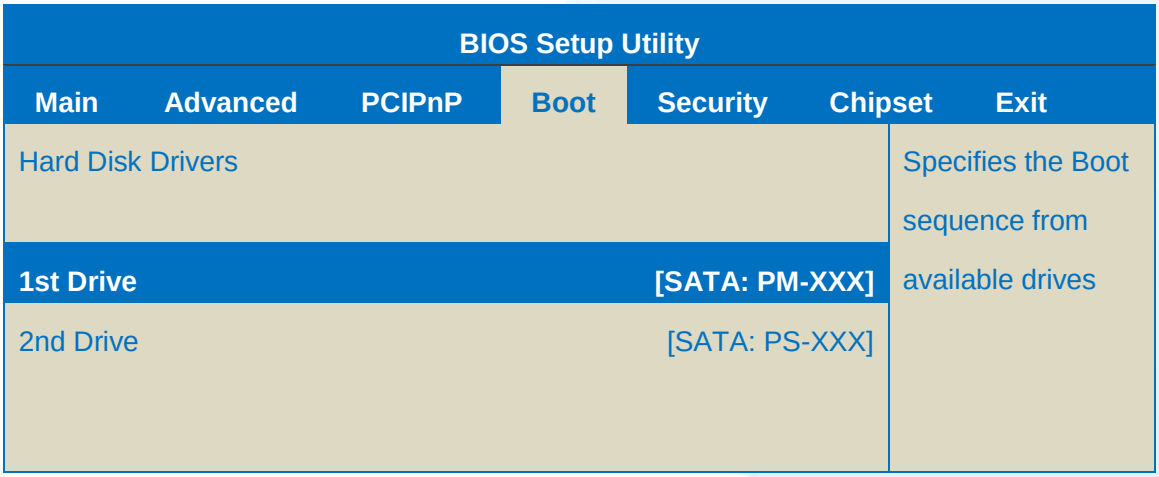
**8.** enter 4, **(4) Quit rescue disk and reboot**


XP-8000-Atom Rescue Disk -- Main Menu
Choose one of the followings:
(1) Recover XP-8000-Atom to factory default
(2) Upgrade XP-8000-Atom manually
(3) Display Drive [C]
(4) Quit rescue disk and reboot
(5) Command shell
Enter choice: 4

**9.** Repeat step 2 to 6 to set **1st Drive** as **PM-XXX**




**10.** The XP-8000-Atom will take about 8 minutes to complete the process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# 8.2. Restoring the Rescue CF Card

The rescue CF card is rescue equipment that allows you to perform some maintenance tasks on your system in case of failure.

Once the rescue CF card are partitioned or formatted, you must restore the rescue CF card.

## Requirements

For restoring the Rescue CF card, you should prepare Ghost 11 or later, which you could obtain by contacting Symantec (http://www.symantec.com)

In this article, we will use Symantec Norton Ghost32 V.11 (The Symantec Norton Ghost V.11 or above version are recommend) to restore the rescue CF card.

**To restore the rescue CF card**

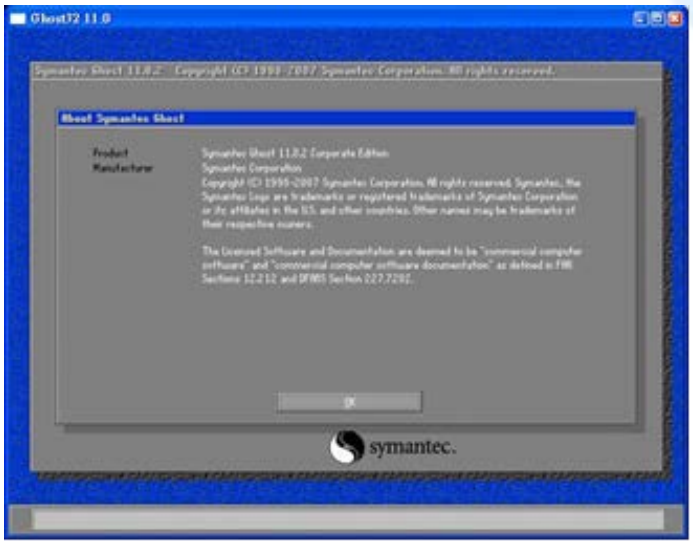
**1.** Get the rescue ghost file, rescue_atom.gho

The rescue_atom.gho file can be installed from the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\XPAC-Atom\Rescue_Disk\

ftp://ftp.icpdas.com/pub/cd/xpac-atom/rescue_disk/

**2.** Open the Symantec Norton Ghost32 V.11, and then click **OK**





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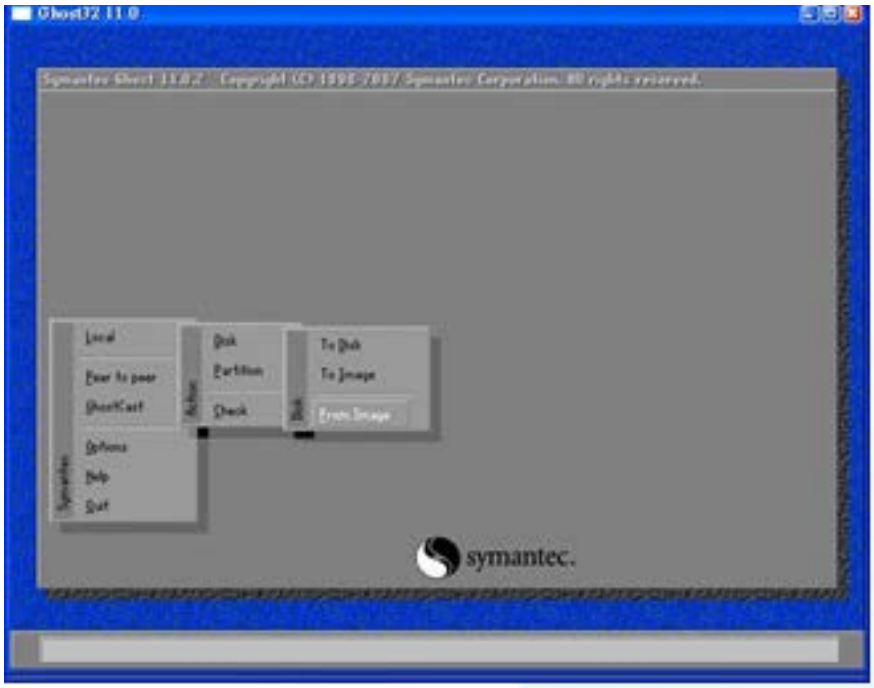
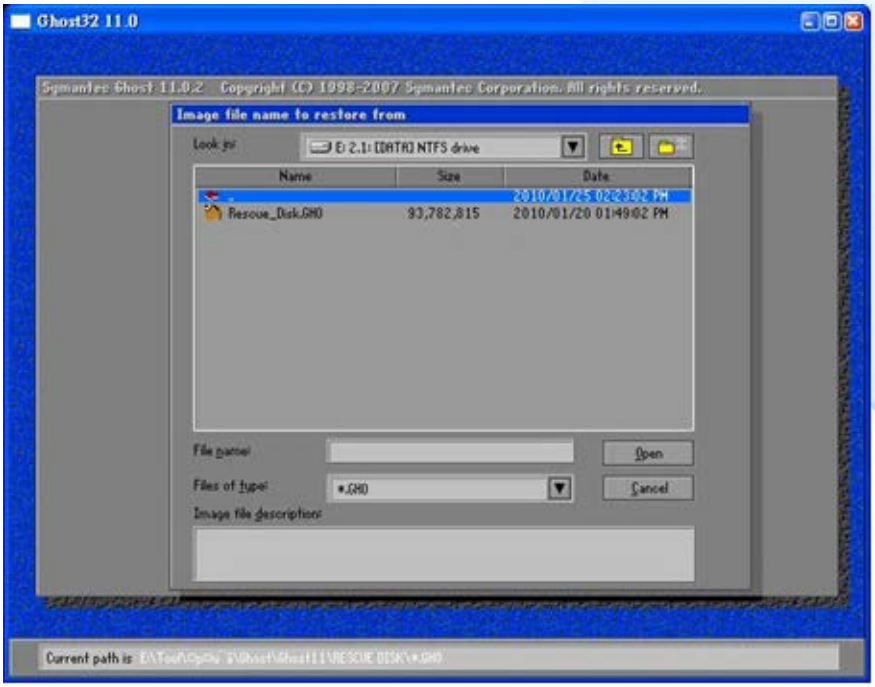
**3.** Click **Function** Menu, point to **Local**, point to **Disk**, and then click **From Image**




**4.** Select rescue ghost file, rescue_atom.gho, that you saved and then click **Open**





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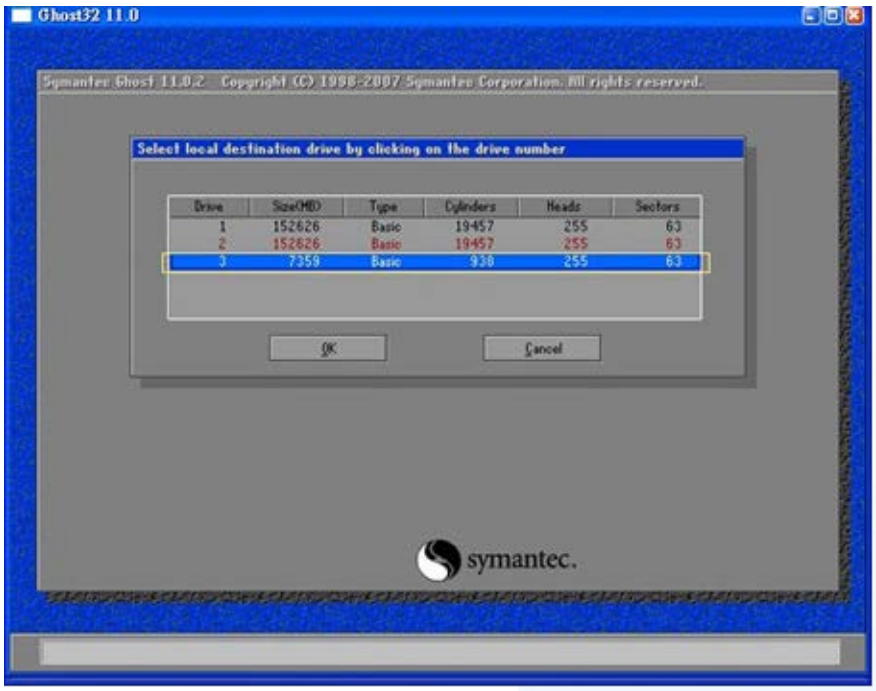
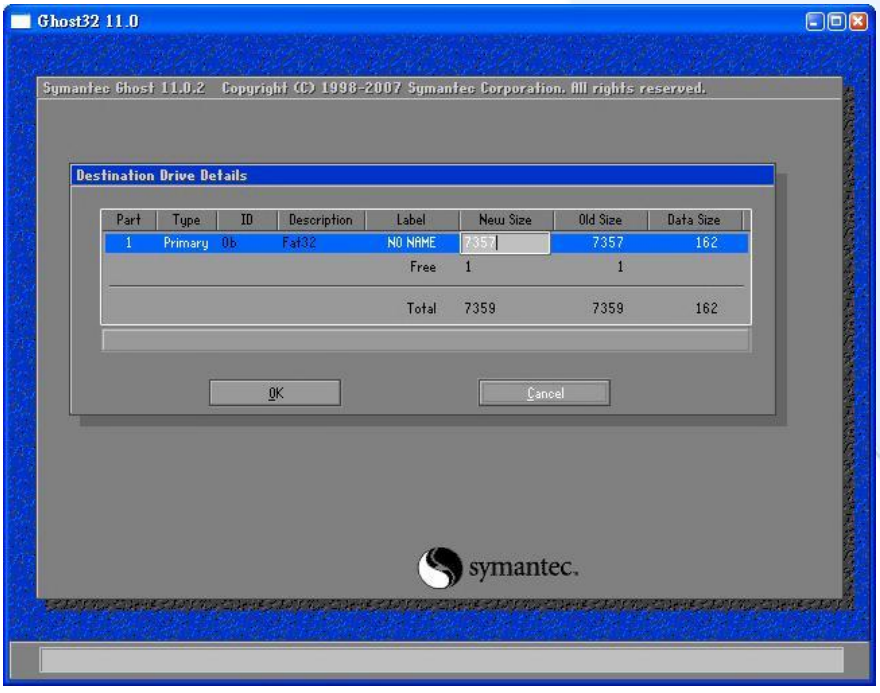
**5.** Select the destination to CF card and click then **OK**




**6.** Recovery the rescue ghost file, rescue_atom.gho, into CF card and then click **OK**





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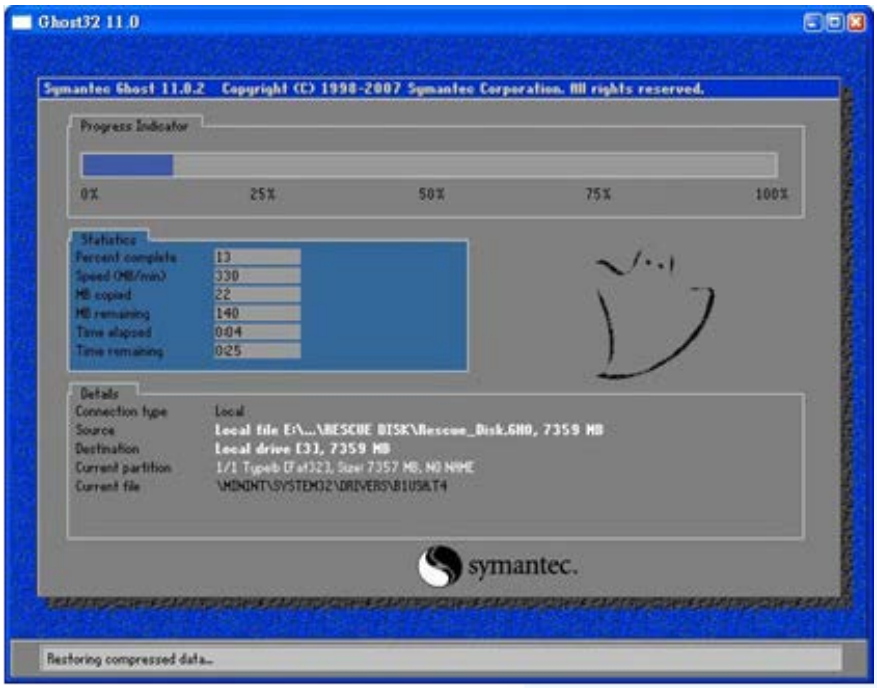
**7.** The rescue CF card has been done





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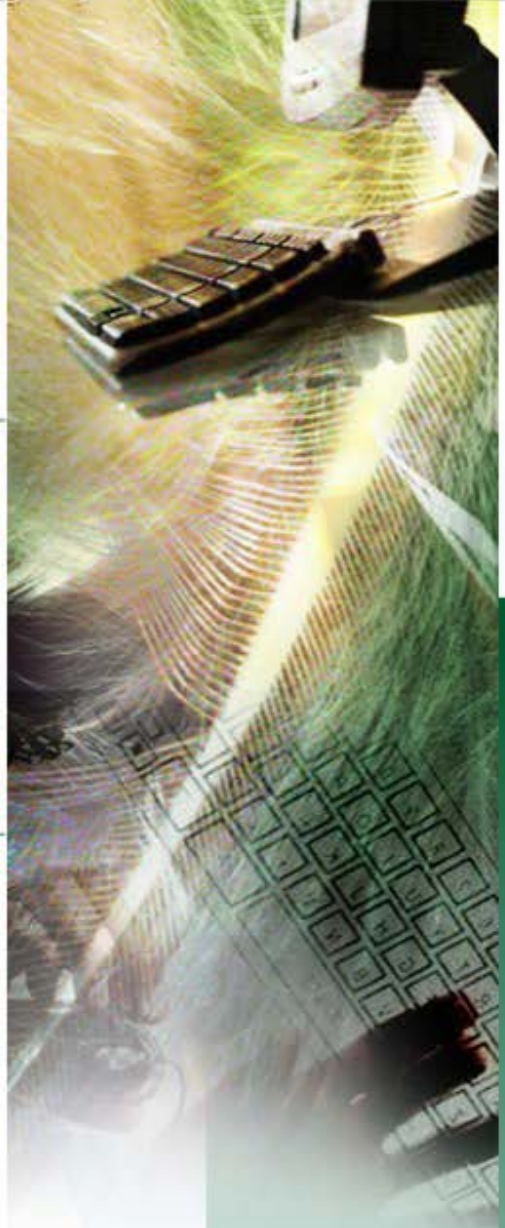

# 9. XP-8000-Atom Updates

This chapter provides information of the XP-8000-Atom OS and firmware, and a guided tour that describes the steps needed to update the XP-8000-Atom OS or firmware.


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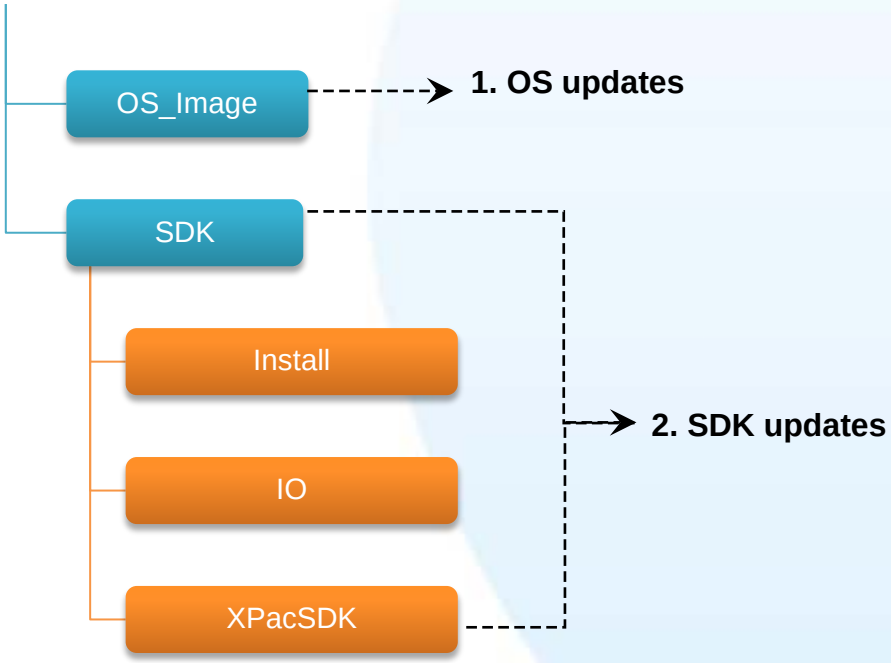
ICP DAS will continue to add additional features to XP-8000-Atom SDK and OS in the future, so we advise you to periodically check the ICP DAS web site for the latest updates.

XP-8000-Atom updates services provides a software update service for XP-8000-Atom. It can be divided into two categories, OS updates and SDK updates.

Both the OS updates services and SDK updates services can be found separately on the CD that was provided with the package or by downloading the latest version from ICP DAS web site.

CD:\XPAC-Atom\
ftp://ftp.icpdas.com/pub/cd/xpac-atom/





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# 9.1. OS updates

OS updates are part of the XP-8000-Atom updates services to provide additional and more efficient features and functionality for XP-8000-Atom operating system.

**To update the XP-8000-Atom OS**

1. Download the latest version of the XPAC OS image to CF card

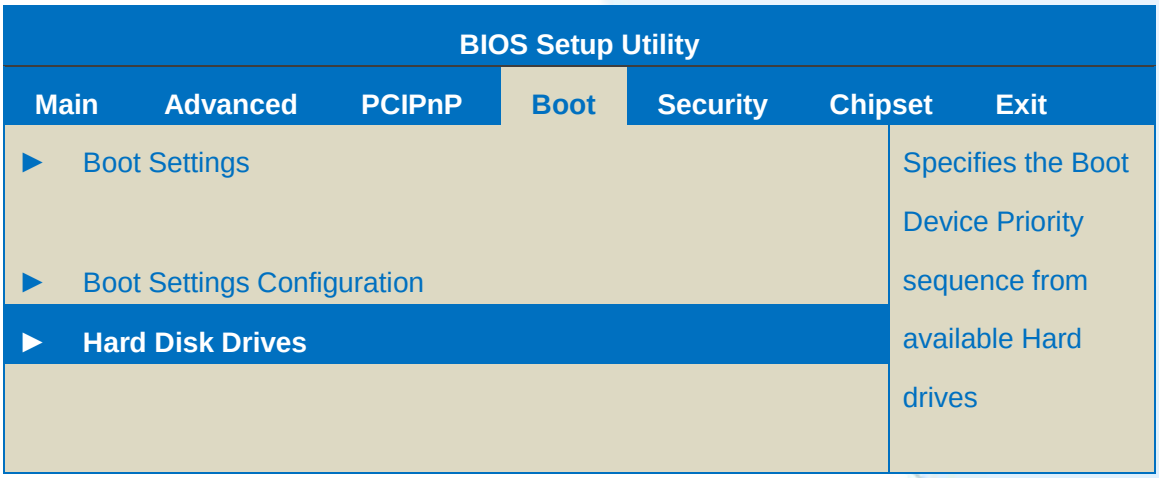
   The latest version of the XPAC OS image can be obtained from ICP DAS web site.

   ftp://ftp.icpdas.com/pub/cd/xpac-atom/os_image

2. Plug the **Rescue** CF card into CF slot

3. Restart XP-8000-Atom, enter the BIOS by pressing **Delete** key

4. Select **Boot** menu, select **Hard Disk Drives**, and then press **Enter** key




5. Select **1st Drive** and then press **Enter** key

6. Set **1st Drive** as **PS-XXX**, it specifies the XP-8000-Atom to boot form CF card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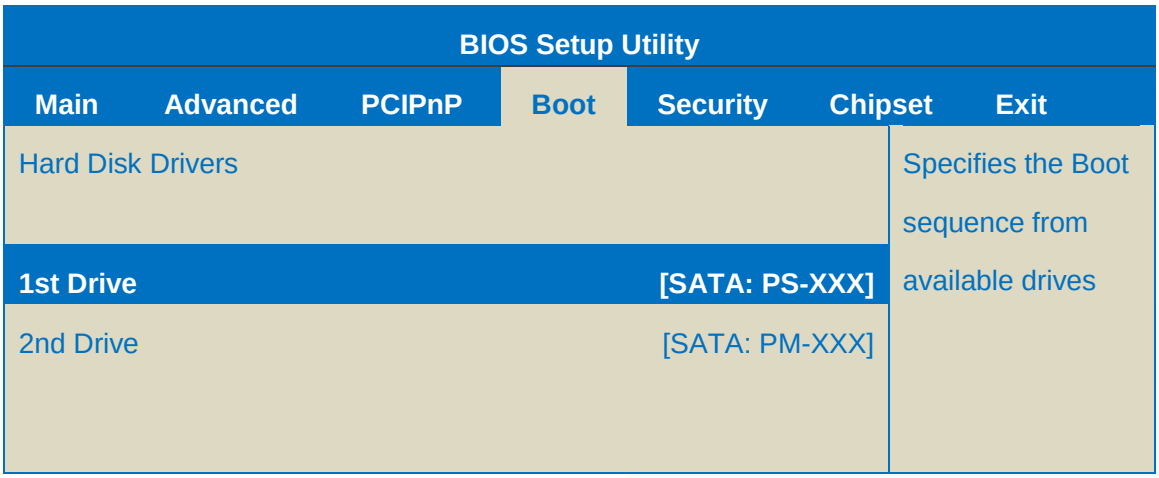
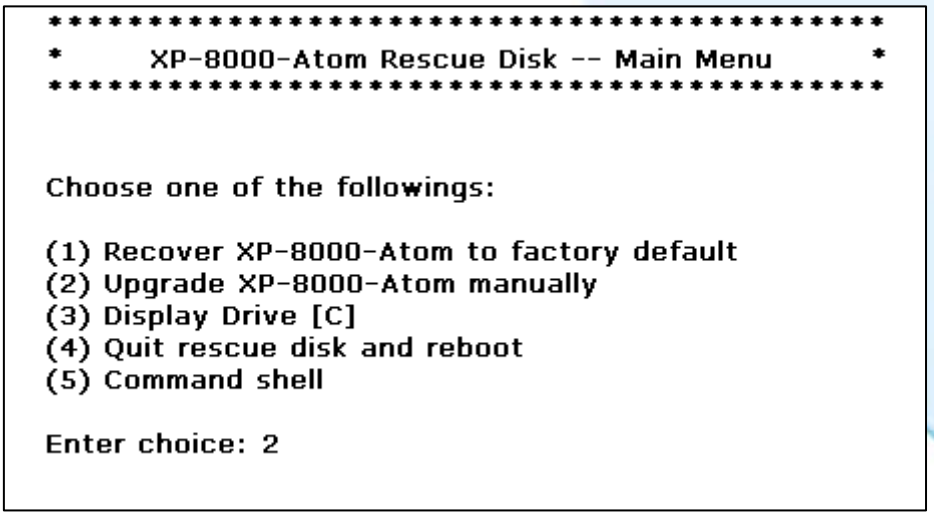



**7.** Press **F10**, and then select **OK** to exit setup utility

The system will restart and enter the XP-8000-Atom Rescue Utility.

**8.** Enter 2, **(2) Upgrade XP-8000-Atom manually**, and then select the latest version of the XP-8000-Atom OS image

The system will upgrade the XP-8000-Atom, and wait a while until the system enters the XP-8000-Atom Rescue Utility again.


**********
* XP-8000-Atom Rescue Disk -- Main Menu *
**********
Choose one of the followings:
(1) Recover XP-8000-Atom to factory default
(2) Upgrade XP-8000-Atom manually
(3) Display Drive [C]
(4) Quit rescue disk and reboot
(5) Command shell
Enter choice: 2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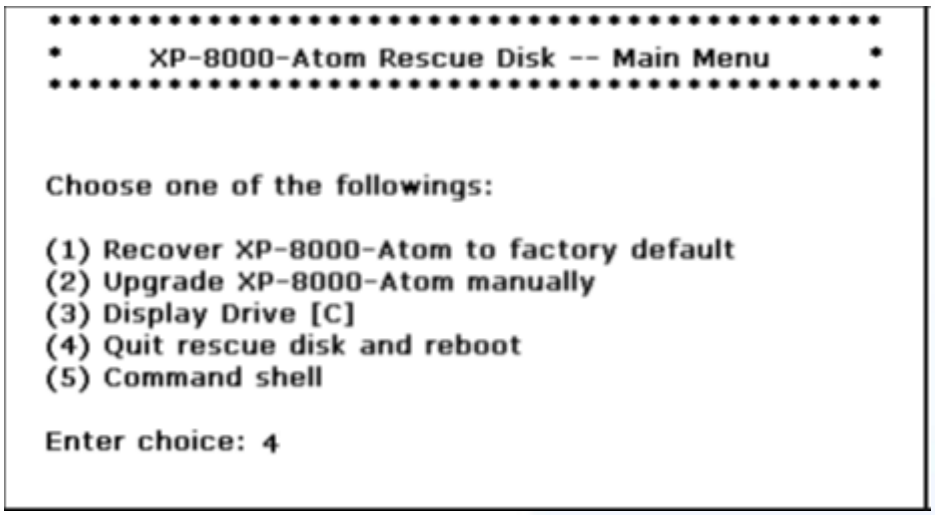
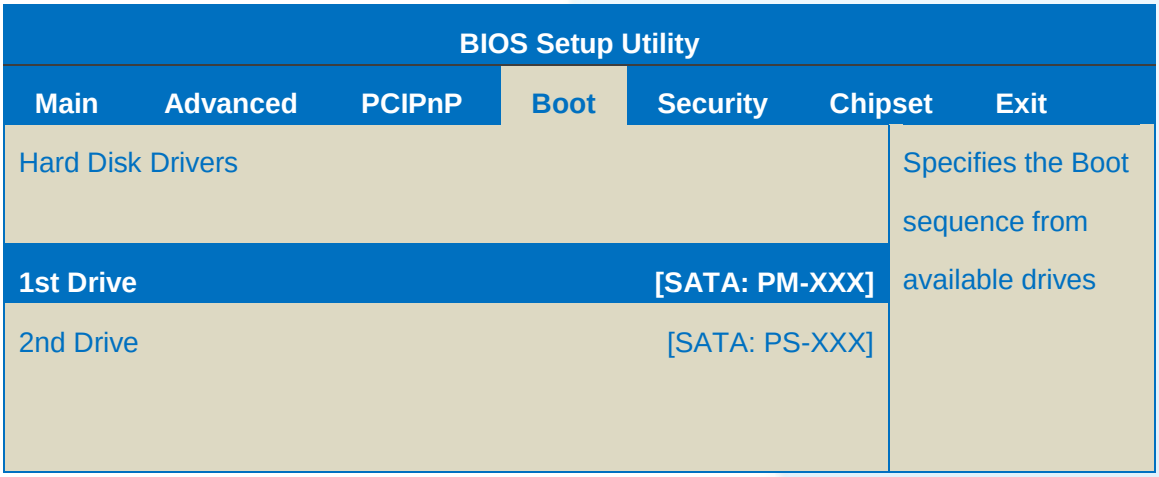
**9.** enter 4, **(4) Quit rescue disk and reboot**


XP-8000-Atom Rescue Disk -- Main Menu
Choose one of the followings:
(1) Recover XP-8000-Atom to factory default
(2) Upgrade XP-8000-Atom manually
(3) Display Drive [C]
(4) Quit rescue disk and reboot
(5) Command shell
Enter choice: 4

**10.** Repeat step 3 to 7 to set **1st Drive** as **PM-XXX**




**11.** The XP-8000-Atom will take about 8 minutes to complete the process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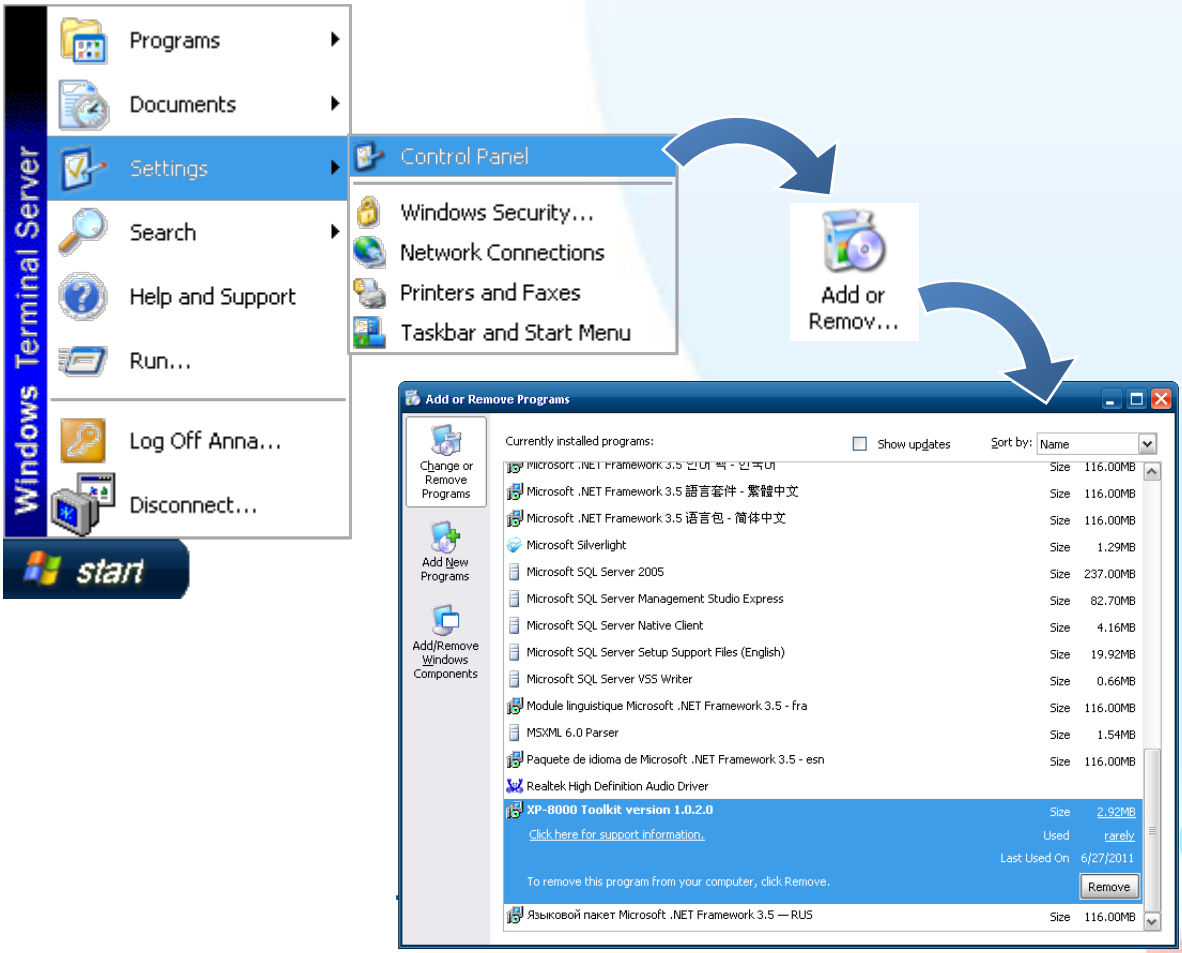
# 9.2. SDK updates

SDK updates are part of the XP-8000-Atom updates services to provide additional and more efficient features and functionality for XP-8000-Atom applications.

Before installing the SDK, you must remove any previously installed versions.

**To remove a previous version of the SDK**

1. Click **Start** menu, point to **Settings**, and then click **Control Panel**
2. Double-click the **Add or Remove Programs**
3. Right-click the entry for the SDK in the list of installed programs, and then click **Remove**





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**To install a new version of the SDK**

**1.** Download the latest version of the XP-8000-Atom SDK

The latest version of the XP-8000-Atom SDK can be obtained from ICP DAS web site.

ftp://ftp.icpdas.com/pub/cd/xpac-atom/sdk/install/

**2.** Double-click the XP-8000-Atom SDK Installation file

**3.** Follow the prompts to install the XP-8000-Atom SDK


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# Appendix A. Application of RS-485 Network

This chapter provides tips and a guided tour on using and maintaining the XP-8000-Atom.


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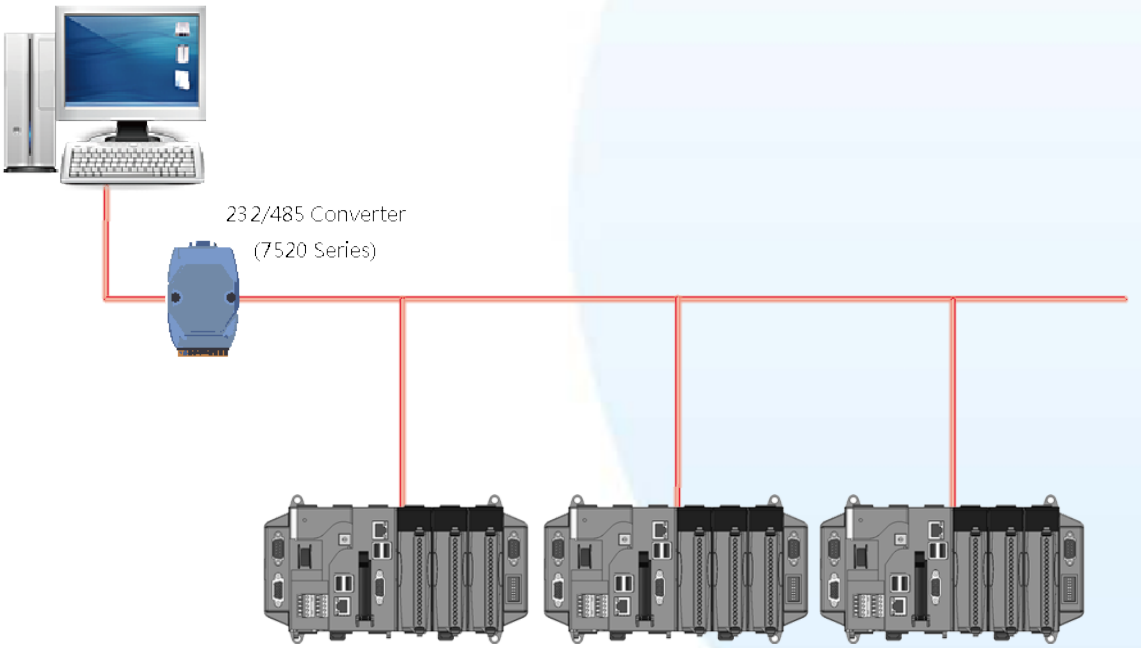
The RS-485 length can be up to 4000 ft or 1.2 km over a single set of twisted–pair cables, if the RS-485 network is over 4000 ft or 1.2Km, the RS-485 repeater must be added to extend the RS-485 network.

# A.1. Basic RS-485 Network

The basic component of the RS-485 network consist of a Master Controller (or using a PC as a host controller), and some RS-485 devices.





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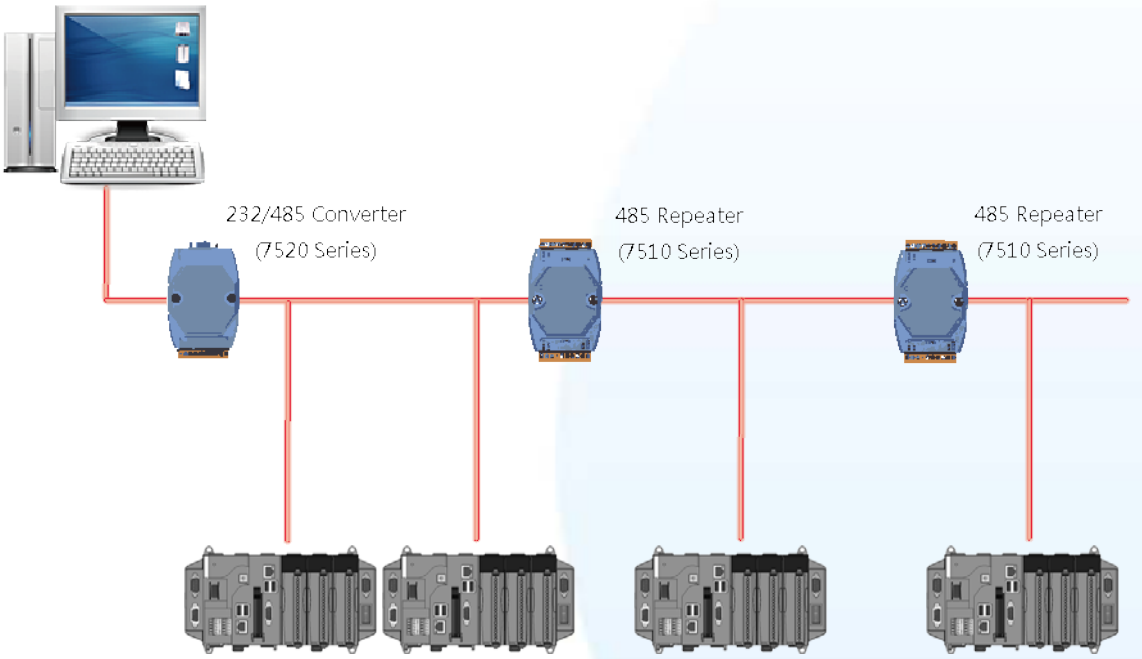
# A.2. Daisy Chain RS-485 Network

All RS-485 devices are wired directly to the main network, If the network is up to 1.2 km, it will need a repeater (7510 series) to extend the network length.





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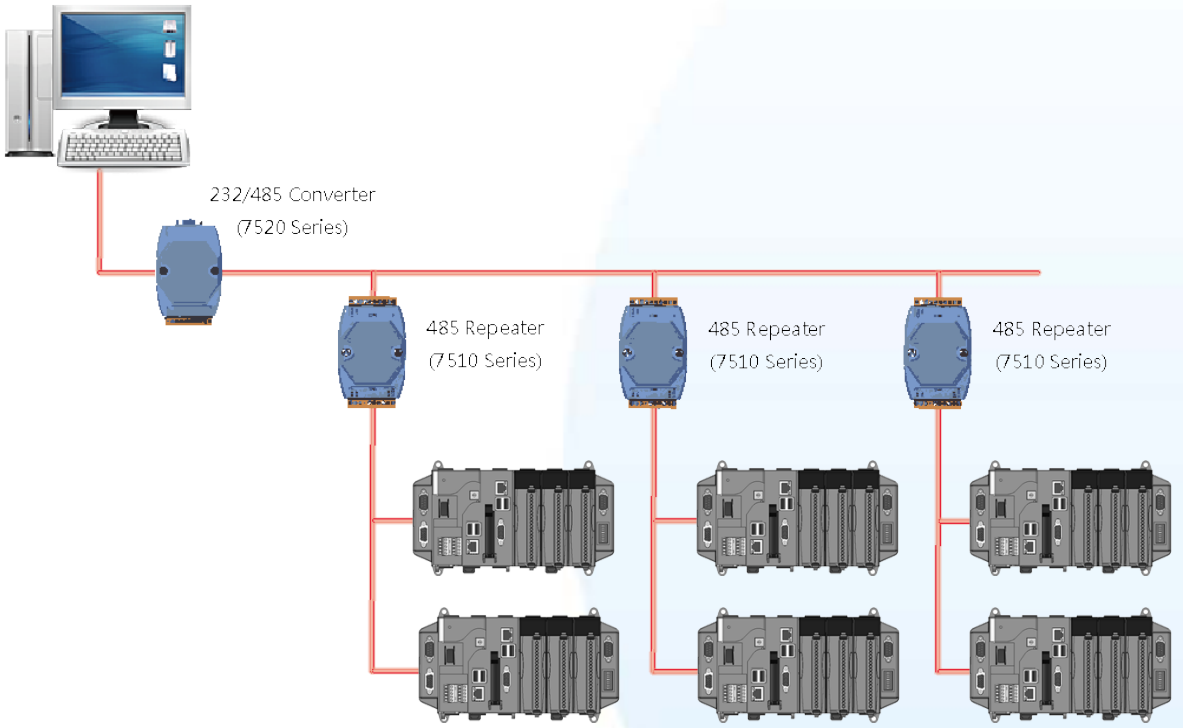
# A.3. Star Type RS-485 Network

There are branches along the main network. In this case, it is better to have a repeater to isolate or filter the noise that is made by devices.





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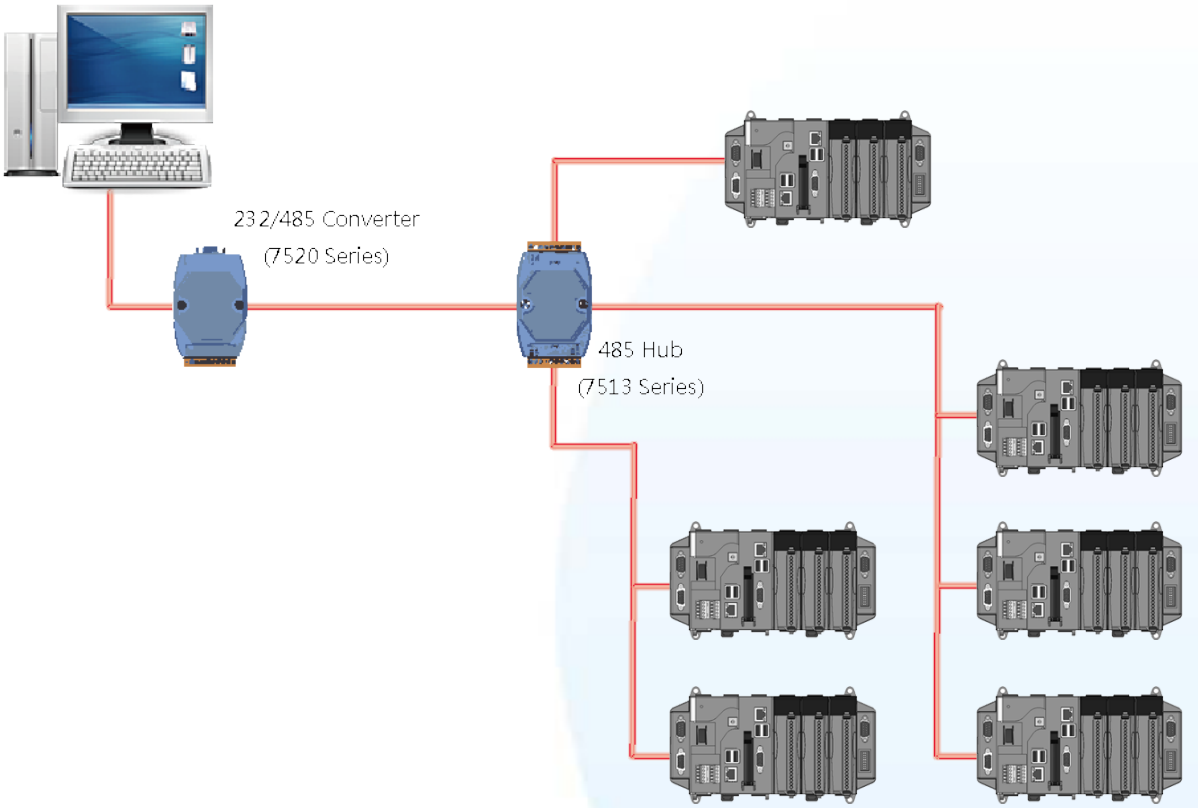
There is a better choice to use 7513 as a RS-485 hub on start type network.





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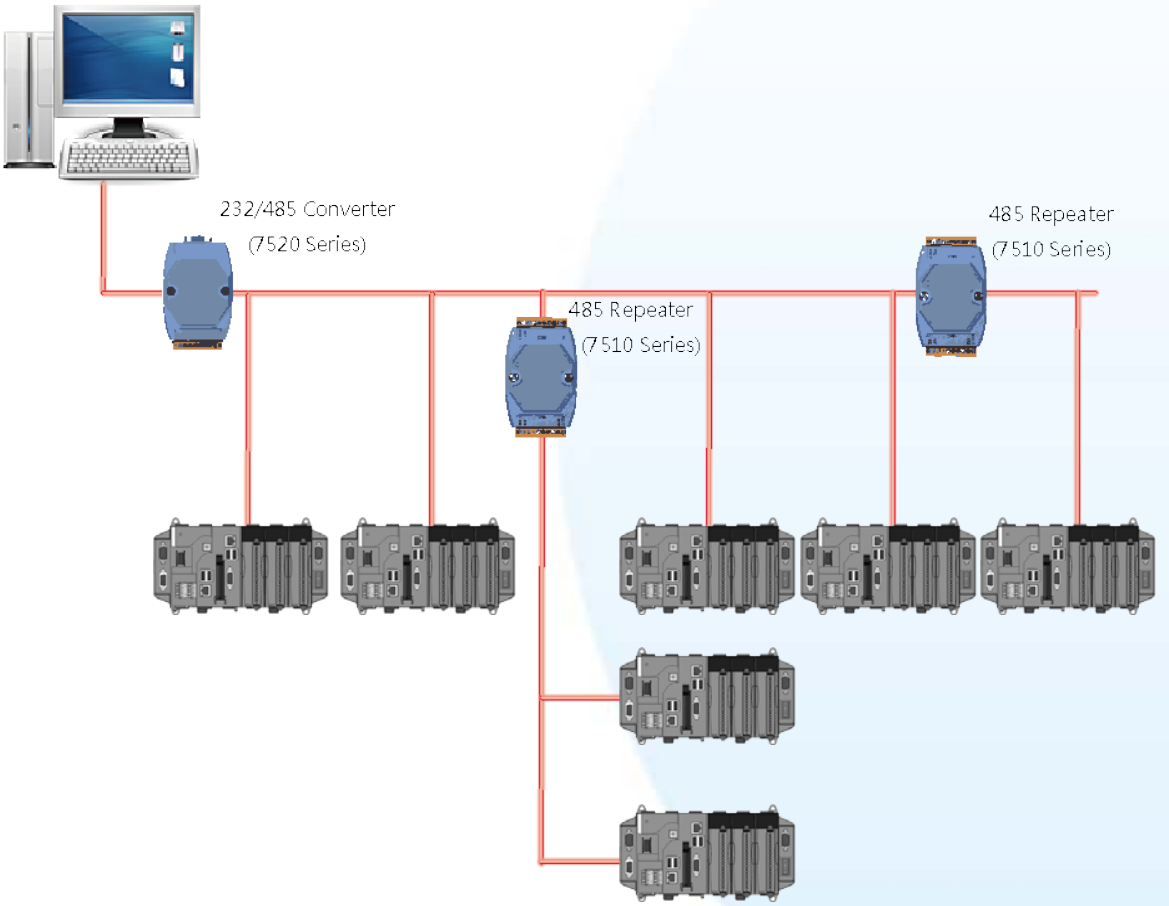
# A.4. Random RS-485 Network

There are branches along the main wire. In this case, it is better to have a repeater to isolate or filter the noise that is made by devices.





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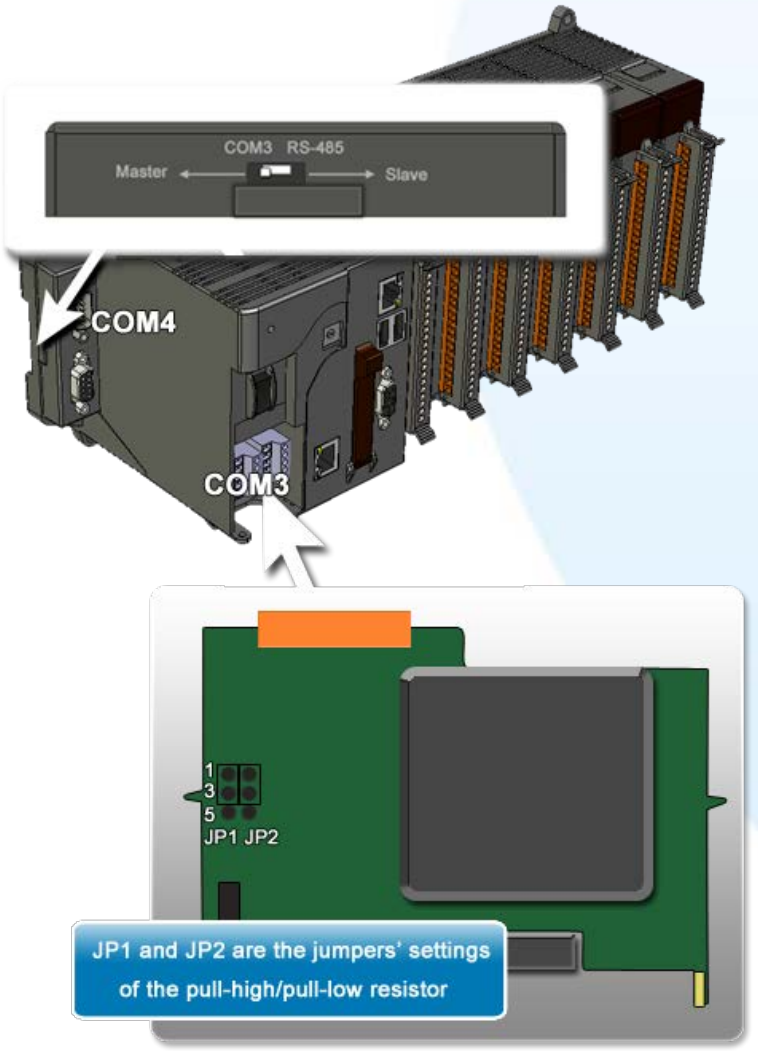
# A.5. Master/Slave Settings

The RS-485 network based on master-slave architecture consists of a single master device and one or more slave devices.

The XPAC provides two RS-485 communication interfaces based on the master-slave system architecture, all of which have a pull-high/pull-low resistor, user can set it to master or slave for implementing an RS-485 multi-drop network.

One of the RS-485 communications, COM3, its pull-high/pull-low resistor located on power board, the other, COM4, located on the right side and its pull-high/pull-low resistor located on the bottom of the right side, as shown below.





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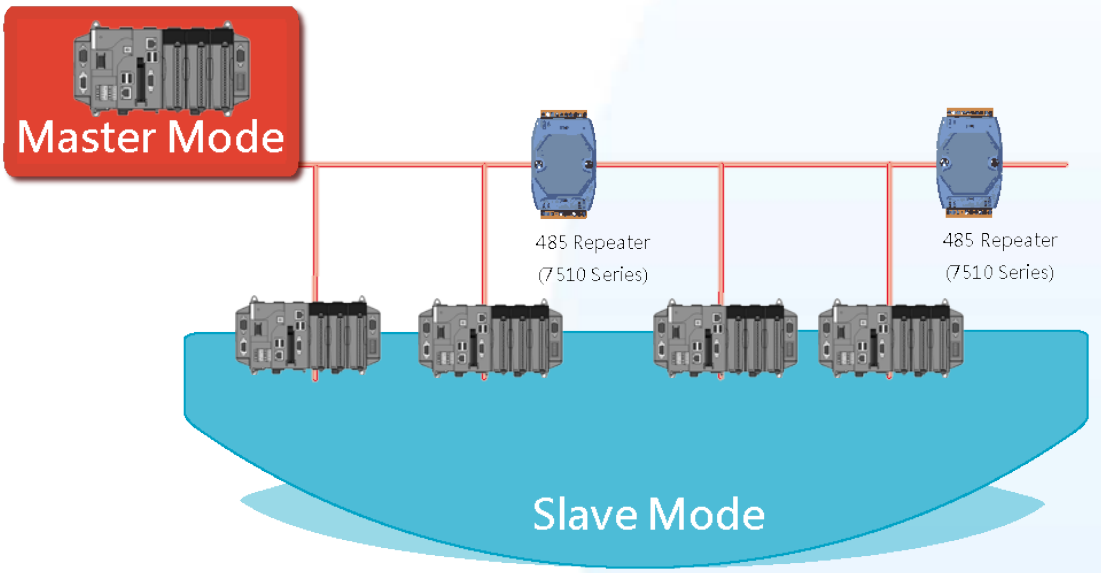
# A.1.1. XPAC as a Master (Default)

When one of XPAC is set to master, then all the other devices on the same network must be slave mode. If the network is up to 1.2 KM, it will need a repeater (7510 series) to extend the network length.





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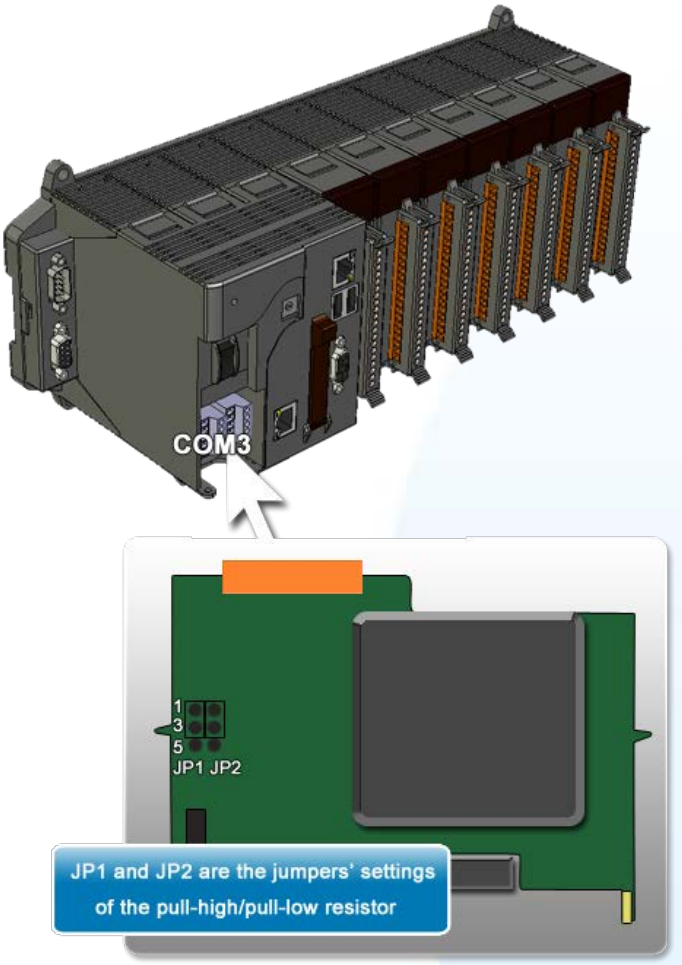
When XPAC as a master using COM3 communication interface, the pull-high/pull-low resistor located on the power board must adjust to enable as shown below.




When XPAC as a master using COM4 communication interface, the pull-high/pull-low resistor located on the power board must adjust to enable as shown below.

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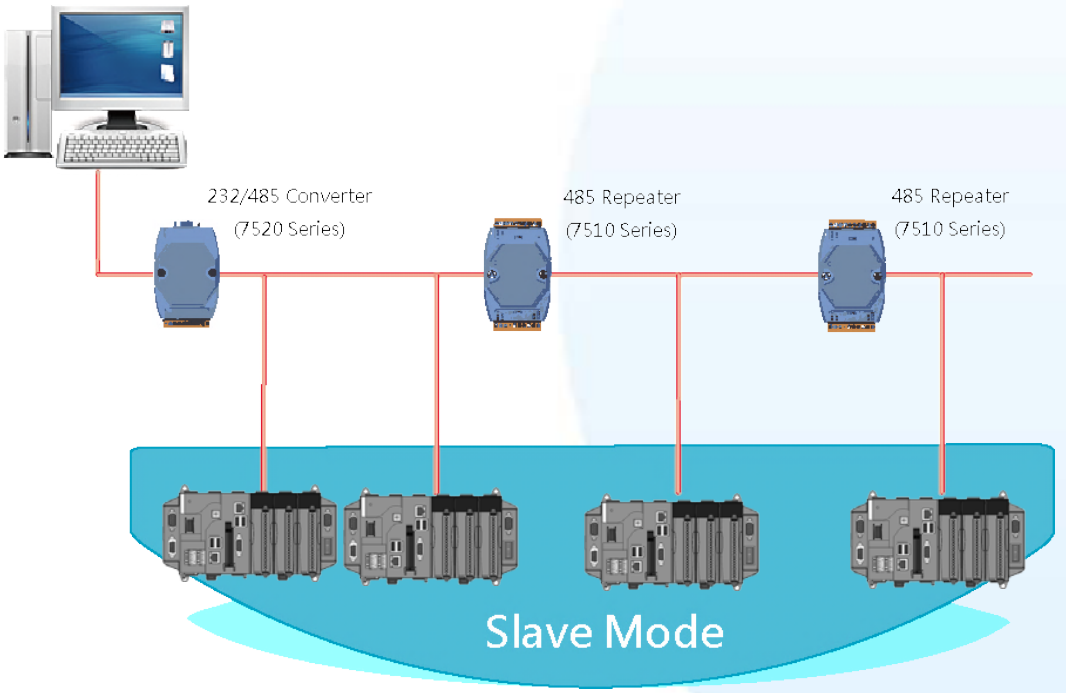
# A.1.1. XPAC as a Slave

For most of application, when using one 7520 series as RS-232/485 converter, its pull-high/pull-low resistors are set to enabled. Then the XP-8000-Atom and all the other devices on this network must be slave mode (the pull-high/pull-low resistors must be disabled).

If there are repeaters on the RS-485 network, there will be pull-high/pull-low resistors on both sides of the repeaters (I-7510)





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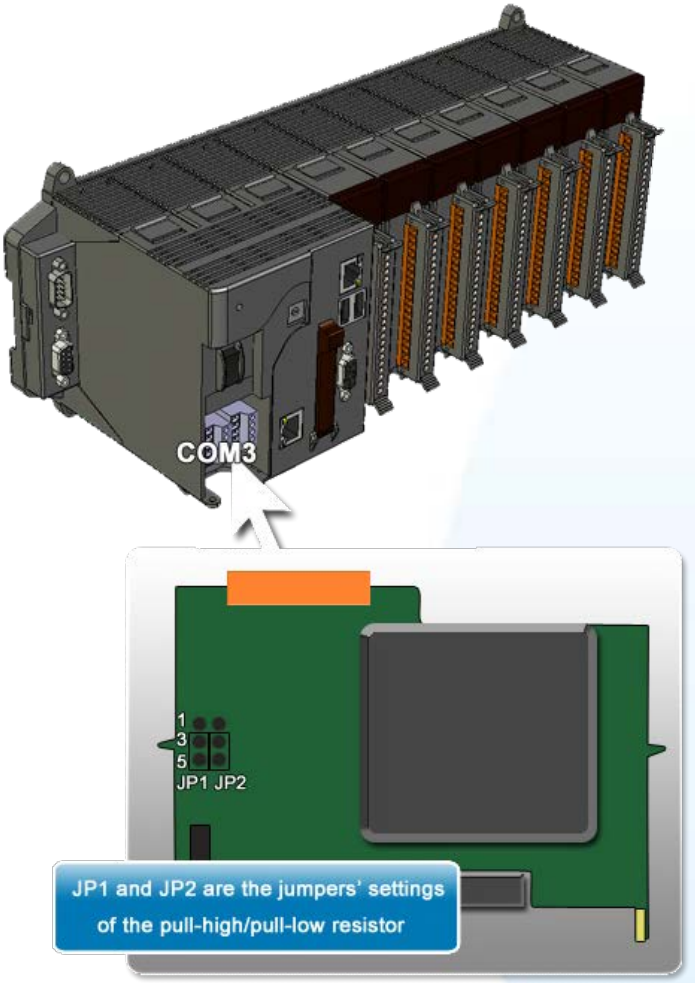
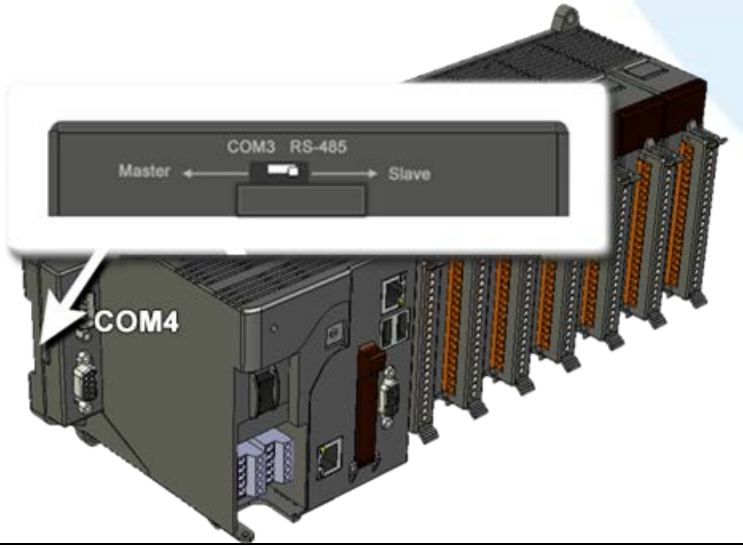
When XPAC as a master using COM3 communication interface, the pull-high/pull-low resistor located on the power board must adjust to enable as shown below.




When XPAC as a master using COM4 communication interface, the pull-high/pull-low resistor located on the power board must adjust to enable as shown below.





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# Appendix B. Revision History

This chapter provides revision history information of this manual.


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The table below shows the revision history.

| Revision | Date | Description |
|---|---|---|
| 1.0.1 | June 2011 | Initial issue |


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